

Final

Environmental Impact Report

for the

San Onofre Nuclear Generating Station (SONGS) Units 2 & 3 Decommissioning Project

VOLUME II
(FEIR Part III)

State Clearinghouse No. 2016071025
CSLC EIR Number: 784; PRC 6785.1

Lead Agency:
California State Lands Commission
100 Howe Avenue, Suite 100 South
Sacramento, CA 95825

Established in 1938

February 2019



MISSION STATEMENT

The California State Lands Commission provides the people of California with effective stewardship of the lands, waterways, and resources entrusted to its care through preservation, restoration, enhancement, responsible economic development, and the promotion of public access.

CEQA DOCUMENT WEBSITE
www.slc.ca.gov/Info/CEQA.html

Project Offshore Geographic Location

	Latitude	Longitude
End of Unit 2 Discharge Conduit	33° 20' 55.8" N	117° 34' 13.5" W
End of Unit 3 Discharge Conduit	33° 21' 11.7" N	117° 33' 51.6" W

Source: California Regional Water Quality Control Board San Diego Region, Order No. R9-2015-0073, NPDES No. CA0109282

Document prepared in coordination with:

Aspen environmental group

California State Lands Commission

FEIR PART III – REVISIONS TO THE DRAFT EIR

Final Environmental Impact Report for the San Onofre Nuclear Generating Station (SONGS) Units 2 & 3 Decommissioning Project (PRC 6785.1; State Clearinghouse No. 2016071025), February 2019

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LIST OF ABBREVIATIONS AND ACRONYMS

	°C	degrees Celsius
	°F	degrees Fahrenheit
	µg/m^3	micrograms per cubic meter
	µm	micrometer
A	AADT	Average Annual Daily Traffic
	AAQS	Ambient Air Quality Standards
	AB	Assembly Bill
	ABA	Auxiliary Building Area
	ACM	Asbestos Containing Materials
	ACS	American Community Survey
	AFW	Auxiliary Feedwater
	AHSM	Advanced Horizontal Storage Modules
	ALARA	As Low As Reasonably Achievable
	AOIS	Auxiliary Offshore Intake Structure
	APE	Area of Potential Effect
	APM	Applicant Proposed Measure
	Applicant	Southern California Edison, San Diego Gas and Electric Company, and the City of Riverside
	AR4 and AR5	Intergovernmental Panel on Climate Change Fourth Assessment Report and Fifth Assessment Report
	AREOR	Annual Radiological Environmental Operating Report
	ARERR	Annual Radioactive Effluent Release Report
	ASBS	Areas of Special Biological Significance
	AVE	Area of Visual Effect
	AVLIS	Atomic Vapor Laser Isotope Separation
	AWS	Administrative, Warehouse & Shop Building
	Base	U.S. Marine Corps Base Camp Pendleton
B	BAU	Business as Usual
	BCC	U.S. Fish and Wildlife Service Birds of Conservation Concern
	BGS	Below Ground Surface
	BIOL	Biological Habitats of Special Significance
	BLM	Bureau of Land Management
	BMPs	Best Management Practices
	BNSF	Burlington Northern Santa Fe
C	C&D	Cold and Dark
	CAAQS/NAAQS	California/National Ambient Air Quality Standards
	Cal-EPA	California Environmental Protection Agency
	Caltrans	California Department of Transportation
	CAP	Climate Action Plan
	CARB	California Air Resources Board
	CASMET	Condition Assessment, Site Monitoring, and Effects Treatment Plan
	CCA	California Coastal Act
	CCC	California Coastal Commission
	CDC	Center for Disease Control and Prevention

CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife
CDOC	California Department of Conservation
CDP	Coastal Development Permit
CDP	Coastal Development Permit
CDPH	California Department of Public Health
CDWR	California Department of Water Resources
CEC	California Energy Commission
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CERS	California Environmental Reporting System
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
cfs	cubic feet per second
CGP	Construction General Permit
CGS	California Geological Survey
CHP	California Highway Patrol
CHRIS	California Historical Resources Information System
CI	*Coccidioides immitis*
CIS	Consolidated Interim Storage
CISF	Consolidated Interim Storage Facility
CMP	Congestion Management Program
CNDDB	California Natural Diversity Database
CNEL	Community Noise Equivalent Level
CNPS	California Native Plant Society
CO	carbon monoxide
Co	cobalt
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
COCs	constituents of concern
COS	Conservation and Open Space
CPAD	California Protected Areas Data
CPS	Coastal Pelagic Species
CPUC	California Public Utilities Commission
CRANE	Cooperative Research and Assessment of Nearshore Ecosystems
CRC	Coastal and Recreation Serving Commercial
CRHR	California Register of Historical Resources
CRPR	California Rare Plant Rank
CRPR 1A	California Rare Plant Rank, presumed extinct in California
CRPR 1B	California Rare Plant Rank, Rare or endangered in California and elsewhere
CRPR 2	California Rare Plant Rank, Rare or endangered in California, more common elsewhere
CRPR 3	California Rare Plant Rank, More Information Needed
CRPR 4	California Rare Plant Rank, Limited Distribution (Watch List)
CRSMP	Coastal Regional Sediment Management Plan
Cs	cesium

	CSLC	California State Lands Commission, CEQA Lead Agency
	CSRP	California State Rail Plan
	CTMP	Community Trails Master Plan
	CTP	County Trails Program
	CUPA	Certified Unified Program Agency
	CWA	Clean Water Act
	CZMA	Coastal Zone Management Act
D	D&D	Decontamination and Dismantlement
	Db	decibel
	dB re 1 µPa	decibels referenced to 1 micropascal
	DBA	Design Basis Accident
	dBA	A-weighted decibels
	DCGLs	Develop Derived Concentration Guideline Levels
	DCPP	Diablo Canyon Power Plant
	DEH	Department of Environmental Health
	DEPM	Division of Environmental Planning and Management
	DGC	Decommissioning General Contractor (joint venture of AECOM and EnergySolutions [collectively SONGS Decommissioning Solutions])
	DIR	Department of Industrial Relations
	DO	dissolved oxygen
	DOE	U.S. Department of Energy
	DOL	U.S. Department of Labor
	DoN	U.S. Department of Navy
	DOT	U.S. Department of Transportation
	DPM	diesel particulate matter
	DPR	California Department of Parks and Recreation
	DSC	Dry Storage Canister
	DTSC	Department of Toxic Substances Control
E	EA	Environmental Assessment
	EAB	Exclusion Area Boundary
	EDGAR	Emission Database for Global Atmospheric Research
	EFH	Essential Fish Habitat
	EIE	Environmental Impact Evaluation
	EIR	Environmental Impact Report
	EIS	Environmental Impact Statement
	EIS/EIR	Environmental Impact Statement/Environmental Impact Report
	ELEA	Eddy Lea Alliance, LLC
	ENP	Eastern North Pacific
	ENSO	El Niño-Southern Oscillation
	EOD	Explosive Ordnance Disposal
	ERA	East Road Area
	ERO	Emergency Response Organization
	ESHA	Environmentally Sensitive Habitat Area
	ESRI	Environmental Systems Research Institute
	ESU	Evolutionarily Significant Units

F	FAA	Federal Aviation Administration
	FBI	Federal Bureau of Investigation
	FE	Federally Endangered
	FEMA	Federal Emergency Management Agency
	FESA	Federal Endangered Species Act
	FHB	Fuel Handling Building
	FHWA	Federal Highway Administration
	FMC	Fishery Management Council
	FMP	Fishery Management Plan
	FNCP	First Nations Capital Partners
	FONSI	Finding of No Significant Impact
	FP	California Department of Fish and Wildlife fully protected species
	FRED	Field Reporting Environmental Database
	FRP	Fiberglass Reinforced Plastic
	FSS	Final Status Survey
	FT	Federally Threatened
	FTA	Federal Transit Administration
G	G/ATOR	Ground/Air Task Oriented Radar
	GDP	Gross Domestic Product
	GEIS	Generic Environmental Impact Statement
	GHG	greenhouse gas
	GTCC	Greater-Than-Class-C
	GWP	global warming potential
H	H_2S	hydrogen sulfide
	HAPC	Habitat of Particular Concern
	HFC	hydrofluorocarbon
	HIRT	Hazardous Incident Response Team
	HLW	High-Level Radioactive Waste
	HMBP	Hazardous Materials Business Plan
	HMD	Hazardous Materials Division
	HMS	Highly Migratory Species
	HSA	Historical Site Assessment
	HVAC	Heating, Ventilation, and Air Conditioning
	Hz	hertz
I	I-5	Interstate 5
	ICAPCD	Imperial County Air Pollution Control District
	ICB	Inner California Continental Borderlands
	IFMP	Irradiated Fuel Management Plan
	IND	Industrial Service Supply
	INN	Invasive Non-Native
	INRMP	Integrated Natural Resources Management Plan
	IPCC	Intergovernmental Panel on Climate Change
	ISA	Intake Structure Area
	ISFSI	Independent Spent Fuel Storage Installation
	ISO	International Standards Organization

K	KVA	kilovolt-ampere
L	L01, L10, L50, L90	A-weighted noise levels that are exceeded 1, 10, 50, and 90 percent of the time, respectively, during the measurement period
	LCP/LUP	Local Coastal Program/Land Use Plan
	L_{dn}	day/night noise level
	L_{eq}	equivalent noise level
	LIDAR	Light Detection and Ranging
	LLD	Lower Limit of Detection
	LLRW	Low-Level Radioactive Waste
	L_{max}	maximum noise level
	LOEDs	Large Organism Exclusion Devices
	LOS	Level of Service
	LOSSAN	Los Angeles-San Diego-San Luis Obispo
	LTR	License Termination Rule
	LWRs	Light Water Reactors
M	M	moment magnitude scale
	MAPS	Manhole Access Port Structures
	MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
	MCBCP	Marine Corps Base Camp Pendleton
	MCIWEST	Marine Corps Installation – West
	MCTSSA	Marine Corps Tactical Systems Support Activity
	MDA	minimum detectable activity
	MDAQMD	Mojave Desert Air Quality Management District
	MEC	Marine Ecological Consultants
	MGD	million gallons per day
	MHHW	mean higher high water
	MHRMC	Mission Hospital Regional Medical Center
	MHW	mean high water
	MISP	Marine Invasive Species Program
	MLD	most likely descendant
	MLLW	mean lower low water
	MLW	mean low water
	MM	Mitigation Measure
	MMO	Marine Mammal Observer
	MMP	Mitigation Monitoring Program
	MMPA	Mammal Protection Act of 1972
	MOA	Memorandum of Agreement
	MOX	mixed oxide
	MP	Major Project
	MPA	Marine Protected Area
	mrem	millirem
	MSL	mean sea level
	MTL	mean tide level
	MUDA	Make Up Demineralizer Area
	MW	megawatt
	MXSOCAL	Marine Exchange of Southern California

N	N/A	not applicable
	NAHC	Native American Heritage Commission
	NAS	Native Aquatic Species
	NAV	Navigation
	NAVD88	North American Vertical Datum (1988)
	NAVFAC	Naval Facilities Engineering Command
	NB	northbound
	NCOA	North Owner Controlled Area
	NCTD	North County Transit District
	NEA	Nuclear Energy Agency
	NEI	Nuclear Energy Institute
	NEPA	National Environmental Policy Act
	NFPA	National Fire Protection Association
	NGVD29	National Geodetic Vertical Datum (1929)
	NIA	North Industrial Area
	NIS	Non-Indigenous Species
	NMFS	National Marine Fisheries Service
	NO_2	nitrogen dioxide
	NOA	Naturally Occurring Asbestos
	NOAA	National Oceanic and Atmospheric Administration
	NOCA	North Owner Controlled Area
	NOP	Notice of Preparation
	NO_X	oxides of nitrogen
	NPAY	North Protected Area Yard
	NPDES	National Pollutant Discharge Elimination System
	NRC	U.S. Nuclear Regulatory Commission
	NRHP	National Register of Historic Places
	NWPA	Nuclear Waste Policy Act
O	ODCM	Offsite Dose Calculation Manual
	OEHHA	Office of Environmental Health Hazard Assessment
	OPC	Ocean Protection Council
	OSHA	Occupational and Safety Health Administration
	OSPR	Office of Spill Prevention and Response
	OWSC	one-way stop control
P	PA	Protected Areas
	PAH	polyaromatic hydrocarbon
	Participants	Southern California Edison Company, San Diego Gas & Electric Company, City of Riverside, and City of Anaheim
	PCBs	polychlorinated biphenyls
	PCG	Pacific Coast groundfish
	pCi/g	picocuries per gram
	PCS	Pacific Coast salmon
	PDO	Pacific Decadal Oscillation
	PFCs	perfluorocarbons
	PFMC	Pacific Fishery Management Council
	PG&E	Pacific Gas & Electric Company

	PGA	Peak Ground Accelerations
	pH	acidity level
	PM	particulate matter
	PM_{10}	PM that is 10 µm or less in diameter
	$PM_{2.5}$	PM that is less than 2.5 micrometers (µm) in diameter
	POIS	Primary Offshore Intake Structure
	POLB	Port of Long Beach
	ppm	parts per million
	PPV	peak particle velocity
	Proposed Project	Applicant's proposed scope of work evaluated in the EIR
	PSDAR	Post Shutdown Decommissioning Activities Report
	PSRR	Pacific Sun Railroad
	PTO	Permit to Operate
	PTS	Permanent Threshold Shifts
R	Radwaste	Radioactive Waste
	RCA	Radiological Controlled Area
	RCP	Representative Concentration Pathway
	RCRA	Resource Conservation and Recovery Act
	RCS	Reactor Coolant System
	REMP	Radiological Environmental Monitoring Program
	RMA	Radioactive Material Area
	RMS	root-mean-square
	RPO	Resource Protection Ordinance
	RTIP	Regional Transportation Improvement Program
	RUSLE	Revised Universal Soil Loss Equation
	RV	recreational vehicle
	RWP	Radiation Work Permit
	RWQCB	Regional Water Quality Control Board
S	SACCWIS	Statewide Advisory Committee on Cooling Water Intake Structures
	SANDAG	San Diego Association of Governments
	SARs	Safety Analysis Reports
	SB	Senate Bill
	SB	southbound
	SCAPCD	San Diego Air Pollution Control District
	SCAQMD	South Coast Air Quality Management District
	SCB	Southern California Bight
	SCCWRP	Southern California Coastal Water Research Program
	SCE	Southern California Edison Company
	SCIC	South Coastal Information Center
	SCWD	South Coast Water District
	SDAPCD	San Diego Air Pollution Control District
	SE	State Endangered
	SFPI	Spent Fuel Pool Island
	SIO	Scripps Institution of Oceanography
	SIP	State Implementation Plans
	SMCA	State Marine Conservation Area

	SMK	San Mateo kelp
	SNF	Spent Nuclear Fuel
	SO_2	sulfur dioxide
	SOF	Shoreline and Offshore Facilities
	~~SOIS~~	~~Secondary Offshore Intake Structure~~
	SOK	San Onofre kelp
	SONGS	San Onofre Nuclear Generating Station
	SPAY	South Protected Area Yard
	SPCC	Spill Prevention Control and Countermeasure
	SPL	sound pressure level
	SSA	Supplemental Support Areas
	SSC	California Species of Special Concern
	SSCs	Structures, Systems, and Components
	ST	State Threatened
	STA	station number
	SVOC	Semi-volatile organic compounds
	SVP	Society of Vertebrate Paleontology
	SWPPP	Stormwater Pollution Prevention Plan
	SWRCB	State Water Resources Control Board
	SYA	Switchyard Area
	SYDS	South Yard Drain System
	SYFA	South Yard Facilities Area
T	TACs	toxic air contaminants
	TBA	Turbine Building Area
	TEB	Tank Enclosure Building
	TEDE	Total Effective Dose Equivalent
	TMDL	Total Maximum Daily Load
	TPH	total petroleum hydrocarbons
	TSS	total suspended solids
	TTS	Temporary Threshold Shift
U	U.K.	United Kingdom
	U2A; U3A	Unit 2 Area; Unit 3 Area
	UFSAR	Updated Final Safety Analysis Report
	USACE	U.S. Army Corps of Engineers
	USCG	U.S. Coast Guard
	USEPA	U.S. Environmental Protection Agency
	USFWS	U.S. Fish and Wildlife Service
	USGS	U.S. Geological Survey
	USMC	U.S. Marine Corps
	UST	underground storage tank
V	V/C	volume to capacity
	VCT	Vertical Cask Transporter
	VMC	Visual Modification Class
	VOC	volatile organic compound
W	WCS	Waste Control Specialist
	WEAP	Worker Environmental Awareness Program

WGCEP	Working Group on California Earthquake Probabilities
WHO	World Health Organization
WRA	West Road Area

EXECUTIVE SUMMARY

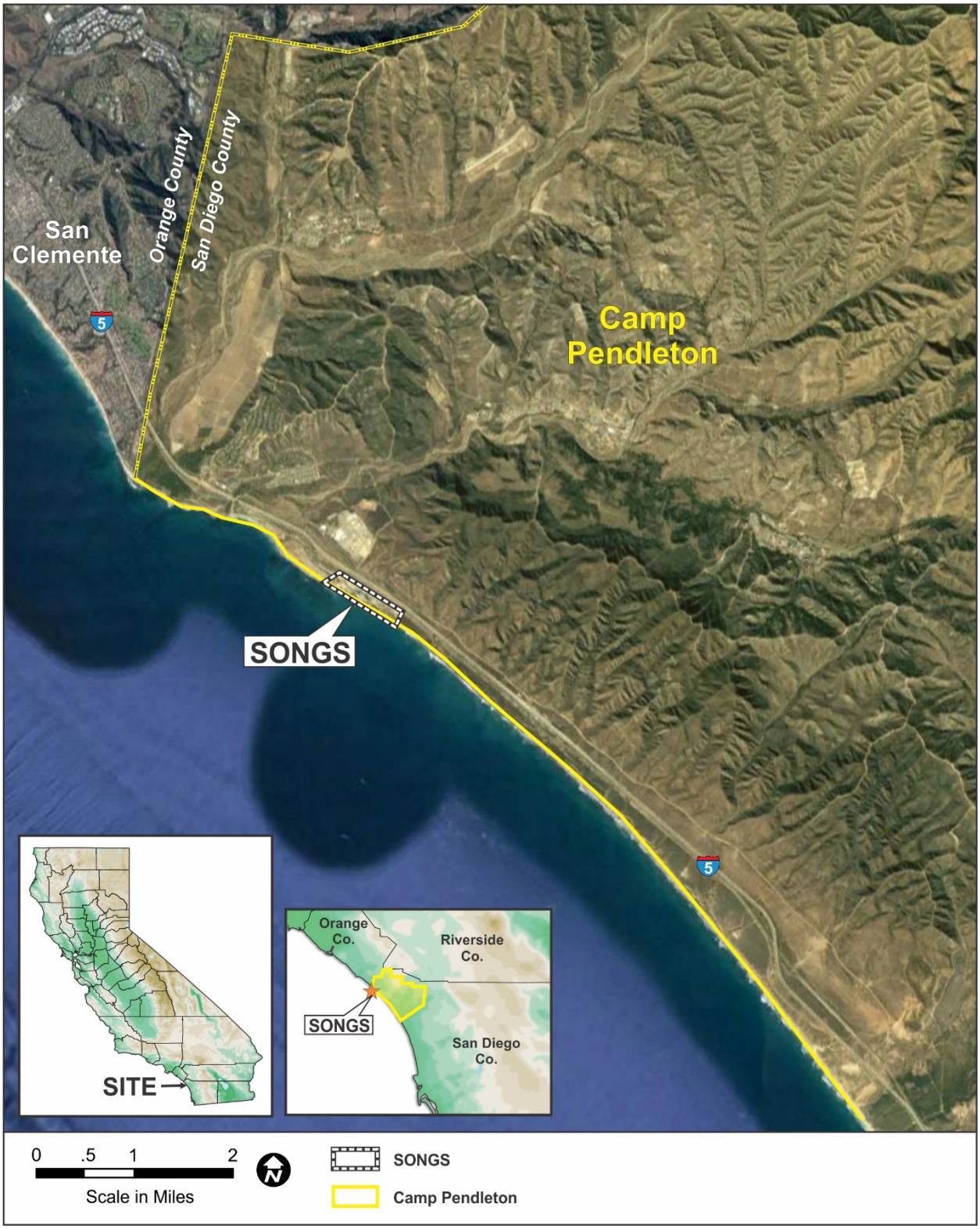
BACKGROUND, PROJECT LOCATION, AND PROJECT SCOPE

The California State Lands Commission (Commission or CSLC) is the lead agency for preparation of this Environmental Impact Report (EIR) pursuant to the California Environmental Quality Act (CEQA; Pub. Resources Code, § 21000 et seq.) because Southern California Edison Company (SCE), San Diego Gas & Electric Company (SDG&E), and the city of Riverside (collectively, **Applicant**) plan to decommission components of San Onofre Nuclear Generating Station (SONGS) that are authorized by CSLC Lease No. PRC 6785.1, which hereinafter is referred to as the **CSLC Lease Facilities**. The CSLC Lease Facilities are the: SONGS Units 2 and 3 offshore intake and discharge conduits and associated appurtenances; navigational and environmental monitoring buoys; and riprap along the shore seaward of the ordinary high-water mark.

SONGS is located on the north San Diego County coast, approximately 50 miles north-northwest of the city of San Diego (Figure ES-1). The nearest city, located approximately 2 miles north-northwest of SONGS, is San Clemente in Orange County. The onshore portion of SONGS lies within the boundaries of the Marine Corps Base Camp Pendleton (MCBCP) under real estate agreements between the Participants and the U.S. Government, Department of Navy (DoN). The DoN-owned land where decommissioning-related work would occur includes an approximately 84-acre easement for the primary nuclear facilities (DoN Easement); two leased parcels adjacent to the DoN Easement, including parking lots and laydown/storage land comprising approximately 15 acres; and easements for an access road and rail spur (Onshore Site). The 21 acres of ~~Offshore Site, which includes~~ tide and submerged lands in the Pacific Ocean, southwest of the Onshore Site (Offshore Site), ~~consists of 21 acres (i.e.,~~ include the majority of the CSLC Lease Facilities area~~)~~.

Decommissioning of the majority of the CSLC Lease Facilities (CSLC Lease Offshore Activities) is part of a larger action by SCE, SDG&E, and the cities of Riverside and Anaheim (collectively, **Participants** [the city of Anaheim is not a party to CSLC Lease No. PRC 6785.1]) to address U.S. Nuclear Regulatory Commission (NRC) and landowner requirements to decommission SONGS, which is hereinafter referred to as the **SONGS Decommissioning Plan**. As proposed by the Participants, the SONGS Decommissioning Plan has the following three components: (1) activities related to a separate, already-approved project allowing for the installation, operation, and maintenance of the Independent Spent Fuel Storage Installation (inclusive of both AREVA and Holtec facilities) currently located on-site, from 2015 through 2035 (**Approved Independent Spent Fuel Storage Installation [Approved ISFSI] ~~Expansion, Operation, and Maintenance~~**); (2) activities associated with dismantlement of onshore above-grade structures, meeting NRC requirements for unrestricted use, and ~~disposition of~~ the CSLC Lease Offshore Activities ~~offshore conduits~~, which cover the SONGS

Figure ES-1. Site Location



Units 2 and 3 offshore intake and discharge conduits and associated structures from 2019 through 2028 (collectively, the Proposed Project); and 3) additional activities projected to begin in approximately 2035 including transfer of ~~stored~~ spent nuclear fuel (SNF) to off-site storage, additional substructure removal, and final site restoration (**Future Activities**). Descriptions of the SONGS Decommissioning Plan components are provided in Table ES-1, below, and Table 2-1 in Section 2.0, *Project Description*).

Table ES-1. ~~Proposed~~ SONGS Decommissioning Plan (Summary)

Decommissioning Plan Components			Dates (anticipated)
1	Independent Spent Fuel Storage Installation ~~Expansion,~~ Operation~~,~~ and Maintenance **(Approved ISFSI)**	• Conduct ongoing activities limited to the existing Approved ISFSI operation and maintenance (see Section 3.2.1 and *Cumulative Projects* ID No. 1 in Table 3-2).	**2015-2035**
2	Decontamination and Dismantlement (D&D) and ~~Conduit Disposition~~ CSLC Lease Offshore Activities **(Proposed Project)**	• Conduct majority of the D&D work for the ~~o~~Onshore ~~s~~Site components, in accordance with NRC requirements • ~~Partially remove intake and discharge conduit components and modify the Unit 2 discharge conduit for future use, if needed~~ • Remove offshore components and install mammal exclusion barriers for the Units 2 and 3 conduits • Place temporary solid covers on top of the mammal exclusion barriers on the Unit 2 discharge conduit to allow for future use, if needed.[1] • Remove navigational and environmental monitoring buoys and anchors	**2019-2028**
3	Additional Substructure Removal and Final Site Restoration **(Future Activities)**	• Transfer SNF off-site and dismantle the Approved ISFSI • Remove additional onshore subsurface material (Units 1, 2, and 3), if required by the U.S. Department of Navy (DoN) • Remove remaining shoreline structures (seawall, walkway, and riprap) • Restore site pursuant to DoN requirements • Remove ~~or abandon Unit 2 discharge conduit~~ temporary solid covers and remaining diffuser ports on the Unit 2 discharge conduit • Remove ~~remaining diffuser ports~~ or abandon in place Units 2 and 3 conduits	**~2035 ***

Source: SCE-HN 2018b.

Note: * Subject to identifying an off-site fuel storage location, permitting and execution of these Future Activities could occur sooner or later than 2035

[1] Any future use of the Unit 2 discharge conduit would require prior review and approval of CSLC staff.

The geographic scope of this EIR covers both onshore and offshore activities that would be performed during the Proposed Project, not only decommissioning activities involving the CSLC Lease Facilities. Many of these activities, particularly those occurring onshore and those related to upland plant decommissioning and radiological decontamination, are beyond the CSLC's jurisdiction. This is because: (1) CSLC's jurisdiction at SONGS is seaward of the ordinary high-water mark; (2) onshore activities at SONGS are on federal (DoN)-owned lands; and (3) NRC has complete oversight and compliance authority over the decommissioning of U.S. nuclear power plants, including radiological aspects of decommissioning. CSLC's approvals related to the Proposed Project are therefore limited to its approval of a lease to replace CSLC Lease No. PRC 6785.1 in order to decommission offshore portions of SONGS Units 2 and 3 within the CSLC Lease Facilities area. Because the Proposed Project's onshore activities are located on federal land and are under federal jurisdiction, these activities are likely to occur whether or not CSLC approves the lease associated with the Proposed Project, per the NRC operating license for Units 2 and 3.

The scope of this EIR also discloses for informational purposes, but does not analyze, the following related, but separate and independent components of the overall SONGS Decommissioning Plan ~~activities~~.

Approved ISFSI (2015 – 2035)

The Approved ISFSI is an ~~single,~~ existing spent fuel storage facility that was constructed in two phases (AREVA and Holtec facility installations). The Approved ISFSI is located onshore in an upland area on federal property outside of CSLC's jurisdiction, and its operation is under the exclusive authority of the U.S. government. The state's authority over the siting of the Approved ISFSI is limited to land use approvals issued by the California Coastal Commission (CCC). The Approved ISFSI consists of the ~~expansion,~~ operation~~,~~ and maintenance of (1) ~~the existing above-grade ISFSI approved by the CCC in 2001 (Coastal Development Permit [CDP] No. E-00-014);~~ the 19 above grade fuel storage modules (original AREVA facility) used to store SNF from Unit 1, approved by the CCC in 2000 (CDP No. E-00-001); (2) the expansion to the original AREVA facility (additional 104 fuel storage modules) to store SONGS Units 2 and 3 SNF that was approved by the CCC in 2001 (CDP No. E-00-014); and (~~2~~3) the partially below-grade ~~ISFSI expansion~~ Holtec facility portion of the Approved ISFSI that was approved by the CCC in 2015 (CDP No. 9-15-0228) and completed on January 19, 2018. CCC's approval of the Holtec facility portion ~~expansion~~ is subject to a court settlement that requires SCE to make certain specified efforts to find a new location for the SNF stored in the Approved ISFSI (see below under *Known Areas of Controversy or Unresolved Issues*, and Section 1.2.2.3, *Settlement Agreement*). The Approved ISFSI is further discussed in Section 3.2.1 and *Cumulative Projects* ID No. 1 in Table 3-2.

Future Activities (~ 2035)

Future Activities consist of SONGS Decommissioning Plan work remaining after completion of the Proposed Project. This EIR's discussion of Future Activities is based on the best available information to date or reasonable assumptions as to the anticipated activities required (see Section 1.5.2, *Uncertainty Regarding Future Decommissioning Plan Activities*, and Section 2.0, *Project Description*). These activities would require future environmental review under CEQA, the National Environmental Policy Act (NEPA), or the California Coastal Act (Pub. Resources Code, § 30000 et seq.).

Facilities that would remain after the Proposed Project are the Approved ISFSI, switchyards and their associated support structures, seawall/walkway/riprap, gunite slope protection, a portion of rail tracks, intake/discharge structure beneath the seawall, SDG&E microwave building, tower, and associated support structures. As part of Future Activities, SONGS Unit 1 SSC remnants below the Approved ISFSI would be addressed after all SNF is moved off-site and the Approved ISFSI is dismantled.

Future Activities would involve final site restoration activities that are contingent on removal of the SNF and would conclude with any activities needed for final NRC license termination. Once all SNF has been packaged and shipped off-site, as part of decommissioning, the Approved ISFSI would be dismantled and the seawall, public beach access walkway, and riprap, which are structurally interrelated, would be dispositioned. Depending on any DoN requirements and jurisdictional agency permit conditions, other activities may be performed. The DoN would determine the required end state for the seawall, public beach access walkway, and portion of the riprap located within the DoN Easement. Therefore, the required disposition of these components is currently unknown. Within the CSLC lease area, as part of Future Activities, the Applicant proposes to remove exposed riprap above the beach surface (to approximately -2 feet Mean Lower Low Water based on current tidal data) and abandon any remaining riprap in place. In addition, once the Unit 2 discharge conduit is no longer needed for any Future Activities, such as dewatering, remaining connections would be closed, diffuser ports and the solid covers would be removed, leaving the mammal exclusion barriers, and the conduit either removed or abandoned in place. The CSLC may require removal of the remaining 114 diffuser ports during Future Activities.

If the SNF has not been transferred by 2035, the CCC may determine that the Approved ISFSI needs to be moved. Under that scenario, Future Activities would involve relocation of the Approved ISFSI to a yet to be determined location and packaging and shipping of SNF off-site, assuming a permanent repository or interim storage facility is available. Relocation would likely require reconfiguration of the security features.

PROPOSED PROJECT DESCRIPTION

Most radiological decontamination would occur during Proposed Project implementation (except for activities noted above under Approved ISFSI, and Future Activities related to removing the SONGS Unit 1 remnants below the Approved ISFSI, which include additional substructure removal and final site restoration). The Proposed Project (2019 – 2028) would involve decontamination, dismantlement, and removal of certain above- and below-grade facilities that would be transported to permitted disposal facilities (Table 2-1 lists activities proposed during the Proposed Project). Work would occur in the following areas (see Figure ES-2): Auxiliary Building Area (ABA), East Road Area (ERA), Intake Structure Area (ISA), Make Up Demineralizer Area (MUDA), North Owner Controlled Area (NOCA), North Protected Area Yard (NPAY), South Protected Area Yard (SPAY), South Yard Facilities Area (SYFA), Turbine Building Area (TBA), Unit 2 Area (U2A), Unit 3 Area (U3A), North Industrial Area (NIA), and West Road Area (WRA). Only limited ground-disturbing activities would occur in the Switchyard Area (SYA) and Approved ISFSI portion of the NIA. Decontamination and dismantlement (D&D) activities for onshore structures would be concentrated in areas that were disturbed during SONGS operations, and are covered with asphalt, concrete, or gravel with minimal vegetation. Figure 2-3 depicts the future state of the SONGS site after the Proposed Project is completed. The Participants' objective is to reduce radioactivity on the SONGS site in accordance with NRC regulations for unrestricted use and DoN requirements.

The Proposed Project offshore SONGS Units 2 and 3 ~~Offshore Site components proposed for~~ activities proposed for the CSLC Lease Facilities include removal of ~~include~~:

- two primary offshore intake structure (POIS) structures – one each for Units 2 and 3 intake conduits
- two auxiliary offshore intake structure (AOIS) structures – one each for Units 2 and 3 intake conduits
- 12 diffuser structures – six each for Units 2 and 3 discharge conduits
- 23 manhole access port structures (MAPS) – 12 for Unit 2 and 11 for Unit 3 intake and discharge conduits
- one fish return conduit (terminal end rising above the seafloor)
- three environmental monitoring buoys, which measure air and water temperature (SCE 2018j – DR#7-3), and two navigational buoys, ~~and their attached water quality instruments~~ and anchors (three buoys are near the seaward end of the Units 2 and 3 intake conduits, with two additional buoys located farther to the south (see Figure 1-2 in Section 1.0, *Introduction*).

The intake and discharge conduits would be abandoned in place; however, the Unit 2 discharge conduit, which may be needed for Future Activities, would not be abandoned

Figure ES-2. Major Project Areas



until after Future Activities have taken place. As proposed, the Applicant would remove 12 diffuser port structures from the offshore ends of the conduits, with~~. The CSLC may require removal of~~ the remaining 114 existing diffuser ports to be removed during Future Activities, if required by CSLC.

SUMMARY OF PROJECT OBJECTIVES, PURPOSE AND NEED

To facilitate implementation of the SONGS Decommissioning Plan in a safe, timely, and cost-efficient manner, the Applicant's stated objectives for the Proposed Project are to:

- Reduce radioactivity on the SONGS site in accordance with NRC regulations for unrestricted use.
- Dispose of the offshore facilities in a manner that minimizes navigational hazards, satisfies CSLC requirements, and is least impactful to the environment.
- Commence the Proposed Project in order to promptly complete radiological decontamination of the SONGS site.
- Implement the Proposed Project in a manner that maximizes efficiencies and retains flexibility to respond to future conditions.
- Complete the Proposed Project in a manner that ensures prudent use of ratepayer funds set aside for the SONGS Decommissioning Plan.

The purpose of this EIR is to identify the significant impacts on the environment of the Proposed Project, and feasible mitigation measures or ~~to identify the~~ alternatives ~~to the Proposed Project, and to indicate the manner in which those significant effects~~ that can significantly lessen ~~be mitigated~~ or avoid~~ed~~ such impacts (Pub. Resources Code, § 21002.1, subd. (a)). This EIR is intended to provide the CSLC with information required to exercise its jurisdictional responsibilities with respect to the lease, ~~and~~ which is a component of the Proposed Project (to be considered at a noticed public hearing). Responsible agencies can use the information in a certified EIR in exercising their jurisdictional or regulatory responsibilities related to the Proposed Project.

SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

This EIR assesses the potentially significant impacts of the Proposed Project on the following environmental issue areas:

- Hazardous and Radiological Materials
- Aesthetics
- Air Quality
- Biological Resources
- Cultural and Paleontological Resources
- Cultural Resources – Tribal
- Geology, Soils, and Coastal Processes
- Greenhouse Gas Emissions
- Hydrology and Water Quality
- Land Use and Planning
- Noise
- Recreation and Public Access
- Transportation and Traffic
- Utilities and Public Service Systems

Impacts within each affected environmental issue area are analyzed in relation to pertinent significance criteria. Impacts are classified as one of five categories.

Significant and Unavoidable	A substantial or potentially substantial adverse change from the environmental baseline that meets or exceeds significance criteria, where either no feasible mitigation can be implemented, or the impact remains significant after implementation of mitigation measures
Less than Significant with Mitigation	A substantial or potentially substantial adverse change from the environmental baseline that can be avoided or reduced to below applicable significance thresholds
Less than Significant	An adverse impact that does not meet or exceed the significance criteria of a particular resource area and, therefore, does not require mitigation
Beneficial	An impact that would result in an improvement to the physical environment relative to baseline conditions
No Impact	A change associated with the Project that would not result in an impact to the physical environment relative to baseline conditions

The Proposed Project would generate significant environmental impacts associated with hazardous and radiological materials, air quality, biological resources, cultural resources, Tribal cultural resources, hydrology and water quality, recreation and public access, and transportation and traffic. With the implementation of Applicant Proposed Measures (APMs) and mitigation measures (MMs) identified in this EIR (see Tables ES-2 and ES-3 and Section 7.0, *Mitigation Monitoring Program*), most impacts would be reduced to Less than Significant. However, several impacts related to air quality and radiological materials would remain Significant and Unavoidable, even after the application of feasible MMs. The CSLC staff or CSLC-contracted monitors will monitor all MMs and APMs during implementation of the Mitigation Monitoring Program.

Where an MM or APM requires the participation of another agency (such as a permit or agency-administered program or protocol), those monitoring responsibilities may be assumed by the agency responsible. See EIR Section 7, *Mitigation Monitoring Program*.

SUMMARY OF ALTERNATIVES TO THE PROPOSED PROJECT

CEQA requires identification and evaluation in an EIR of a reasonable range of alternatives to a proposed project. Pursuant to State CEQA Guidelines section 15126.6, subdivision (a), an EIR need only consider a range of feasible alternatives that will foster informed decision-making and public participation; therefore, while an EIR need not consider every conceivable alternative, an EIR must include sufficient information about

Table ES-2. List of Applicant Proposed Measures and Recommended Mitigation

Applicant Proposed Measure (APM)		Mitigation Measure (MM)	
APM-1.	Waste Management Program	MM HAZ-4.	Facility Hazardous Waste Permit Extension
APM-2.	Hazardous Materials Business Plan	MM HAZ-5.	Worker Registration/Certification
APM-3.	Vehicle Emission Reductions	MM HAZ-6.	Soil and Groundwater Site Characterization Study and Soil Management Plan
APM-4.	Dust Suppression		
APM-5.	Vehicle Speeds	MM AQ-3a.	Off-Road Equipment Emissions Control
APM-6.	Track-Out to Public Streets	MM AQ-3b.	Marine Vessel Emissions Control
APM-7.	Tarping Trucks	MM BIO-1a.	Worker Environmental Awareness Program
APM-8.	Nesting Bird Deterrents	MM BIO-1b.	~~Habitat Restoration and Revegetation Plan~~Weed Management
APM-9.	Conduit Work Plan	MM BIO-1c	Rare Plant Surveys
APM-10.	Cultural Resources Protection	MM BIO-2a.	Special-Status Reptiles and Amphibians
APM-11.	Appropriate Treatment of Human Remains	MM BIO-2b.	Surveys and Monitoring for Nesting Birds
APM-12.	Stormwater Pollution Prevention Plan (SWPPP)	MM BIO-2c.	Burrowing Owl
		MM BIO-2d.	Western Snowy Plover/California Least Tern
APM-13.	Spill Prevention Control and Countermeasure (SPCC) Plan	MM BIO-2e.	Coastal California Gnatcatcher
		MM BIO-2f.	Noise Minimization Plan
APM-14.	Spill Contingency Plan	MM BIO-3.	Sensitive Bat Species
APM-15.	Dredging Plan	MM BIO-4.	Potential ~~Onshore~~ Waters of the U.S./State
APM-16.	Turbidity Monitoring	MM BIO-9.	Hydrogen Sulfide (H_2S) Gas Control Plan
APM-17.	Offshore Spill Response Plan	MM BIO-10.	Anchoring Plan
APM-18.	Notification to Local Mariners	MM BIO-11.	Marine Mammal and Sea Turtle Mitigation and Monitoring Plan
APM-19.	Emergency Services Access	MM BIO-12.	Invasive Non-Native Aquatic Species (NAS)
APM-20.	Oversize/Overweight Loads	MM CR/TCR-2a.	Archaeological and Tribal Monitoring
APM-21.	Pedestrian and Bicycle Access and Safety	MM CR/TCR-2b.	Unanticipated Cultural/Tribal Resources
APM-22.	Private Aids to Navigation	MM CR/TCR-2c.	Cultural Resource Identification during Offshore Geophysical Surveys
		MM CR-4a.	Paleontological Monitoring
		MM CR-4b.	Unanticipated Paleontological Resources
		MM LU-2a.	Deconstruction Liaison
		MM LU-2b.	Advance Notification of Deconstruction
		MM LU-2c.	Quarterly Deconstruction Updates
		MM REC-1a.	Public Notification
		MM REC-1b.	Public Access Plan
		MM WQ-4.	~~Interim Erosion Control Plan~~Onshore Site Stabilization Plan
		MM WQ-5.	Walkway Flood Protection Plan

each alternative to allow meaningful evaluation, analysis, and comparison with the proposed project. The range of potential alternatives that must be and are considered in this EIR is limited to those that would feasibly attain most of the Proposed Project objectives while avoiding or substantially reducing any of the significant effects of the Proposed Project. Alternatives that were considered but rejected are identified and accompanied by brief, fact-based explanations of the reasons for rejection. Among the factors that may have been used to eliminate alternatives from detailed consideration, as permitted by CEQA, are (1) a failure to meet most of the Proposed Project objectives, (2) infeasibility, or (3) inability to avoid significant impacts (State CEQA Guidelines § 15126.6, subd. (c)). Alternatives carried forward for analysis in this EIR are summarized below

- **No Project Alternative**. The Applicant's request for a new CSLC lease would not be approved. Therefore, the lease for the Unit 2 and Unit 3 offshore conduits, environmental monitoring buoys, and riprap along the shore seaward of the ordinary high-water mark would expire in 2023. The Units 2 and 3 offshore conduits~~,~~ and navigational and environmental monitoring buoys~~, and shoreline riprap (seaward of the ordinary high-water mark) would not be dispositioned and~~ would remain in their current position and configuration. Onshore decommissioning activities would continue per the operating license for Units 2 and 3 granted by the NRC, although some aspects of the Proposed Project activities would be subject to approval by the CCC.
- **Full Removal of Offshore Conduits**. This alternative includes full removal of the SONGS Unit 2 and Unit 3 offshore intake and discharge conduits (inclusive of all vertical structures), fish return, navigational and environmental monitoring buoys and anchors. All other aspects of this alternative would be identical to the Proposed Project.
- **Partial Removal of Offshore Conduits**. This alternative includes full removal of the SONGS Unit 2 and Unit 3 offshore intake and discharge conduits from the seawall to approximately 300 feet off-shore, leaving the remaining portions of the horizontal conduit and fish return conduit in place. As with the Proposed Project, all vertical structures (primary offshore intake structure, auxiliary offshore intake structure, and manhole access port structures) associated with the intake conduits would be removed. In addition, all diffuser ports on the discharge conduits would also be removed. All other aspects of this alternative would be identical to the Proposed Project.
- **Full (or Partial) Removal of Onshore Subsurface Structures**. All onshore structures would be removed to depths greater than 3 feet (partial) or completely removed (analyzed as worst-case for impact assessment), as opposed to the Proposed Project, which would leave subsurface structures in place as high as 3 feet below the existing local grade. All other aspects of this alternative would be identical to the Proposed Project.

ALTERNATIVES NOT CONSIDERED FOR FULL EVALUATION

Several alternatives were considered, but were determined to be infeasible, did not clearly offer the potential to reduce significant environmental impacts, or did not achieve most of the Proposed Project objectives. These alternatives were eliminated from further evaluation in the EIR and include the following (refer to Section 5.3 for explanation):

- Crush Conduits in Place
- Local Relocation of the Approved ISFSI in 2035
- Containment Buildings for Interim Storage Facilities for SNF
- Laser Reduction of the Isotopes in SNF
- Retention of Spent Fuel Pools
- Full Removal of Shoreline Structures
- Final End-State Restoration Options
- Future Uses for the SONGS Site
- Accelerated Removal of SNF from SONGS
- Alternate Sites for Disposal of SNF and Other high-level radioactive waste (HLW)
- In-State Disposal of Non-Radioactive Waste and Recycling

COMPARISON OF PROPOSED PROJECT AND ALTERNATIVES AND ENVIRONMENTALLY SUPERIOR ALTERNATIVE

State CEQA Guidelines section 15126.6, subdivision (e)(2), states, in part, that an EIR shall identify an environmentally superior alternative among the other alternatives "if the environmentally superior alternative is the 'No Project' alternative" (emphasis added). Table ES-4 compares the Proposed Project impacts with those of the alternatives. For a more detailed comparison of the Proposed Project and alternatives, see Section 6.5, *Comparison of Proposed Project and Alternatives and Environmentally Superior Alternative*. Based on the analysis contained within this EIR, the CSLC has determined that the No Project Alternative would be environmentally superior as it would avoid impacts on the marine environment that are not avoided by the Proposed Project or the other alternatives. Among the other alternatives, the Proposed Project is the Environmentally Superior Alternative because it would have the smallest impact on the marine environment and would have impacts either less than or identical to the other alternatives related to onshore decommissioning activities.

Of the five alternatives analyzed in the EIR, the Full Removal of Offshore Conduits Alternative has been evaluated at a level of detail equivalent to the Proposed Project, as this alternative represents an option subject to CSLC's discretion under the current CSLC Lease No. PRC 6785.1 ~~requirements~~. The other alternatives are evaluated at a lesser level of detail, but with sufficient information to allow meaningful evaluation, analysis, and comparison to the Proposed Project, consistent with CEQA's requirements (State CEQA Guidelines, § 15126.6, subd. (d)).

KNOWN AREAS OF CONTROVERSY OR UNRESOLVED ISSUES

State CEQA Guidelines section 15123, subdivision (b)(2), requires EIRs to contain a brief summary of areas of known controversy including issues raised by agencies and the public. The public has expressed concern about the decommissioning of SONGS due to potential hazards associated with radioactive materials at the facility, particularly the on-site storage of SNF. This is not a new concern as SONGS has been generating HLW in the form of SNF throughout the course of the power plant's operation, which ended in January 2012. Many issues raised by agencies and the public during public scoping for the Proposed Project address ongoing concerns about separate components of the overall SONGS Decommissioning Plan that are not part of the current Proposed Project, including:

- **The ~~new~~ Approved ISFSI ~~expansion~~ and SNF storage**. This concern applies to the Approved ISFSI portion of the SONGS Decommissioning Plan. The plan to store SNF at SONGS until 2035 and the lack of an off-site repository for long-term storage of SNF are concerns both for SONGS and for nuclear power facilities across the nation and await resolution by the federal government. As part of a lawsuit settlement (*Citizens Oversight, Inc., et al. v. the California Coastal Commission, Southern California Edison Company, et al.*, Superior Court for County of San Diego), SCE entered into a Settlement Agreement that requires SCE to use "commercially reasonable efforts" to relocate SONGS SNF to an off-site storage facility. Implementation of the Settlement Agreement could result in the transfer of the SNF to a federally or privately-owned consolidated interim storage (CIS) facility prior to the establishment of a federal repository. Until a viable and reasonable location is identified, it is unknown where the SNF will ultimately be stored and what the associated timeline would be for the off-site relocation of SNF. (See Section 1.2.2.3, *Settlement Agreement*, and Appendix D1: Management, Storage, Transportation, and Disposal of Spent Nuclear Fuel and High-Level Waste at San Onofre Nuclear Generating Station.)

- **Storage ~~casks~~canisters**. This concern also applies to the Approved ISFSI portion of the SONGS Decommissioning Plan. The vendor, Holtec International, revised a storage ~~cask~~canister internal component called the basket shim in 2016. The shims help center the basket, which houses used fuel and fosters the flow of helium to transfer heat from the fuel. As of January 2018, SCE had~~s~~ placed four loaded canisters with the newer basket shim in the concrete storage facility at SONGS. In March 2018, SCE discovered a loose piece of a shim (4 inches by ½ inch) while preparing to load a canister. SCE temporarily paused work transferring the used fuel to the dry storage canisters to evaluate the vendor's fabrication modifications. SCE validated the canisters' integrity for on-site storage safety purposes. SCE asked Holtec and an independent engineering firm to review the original shim basket design to ensure it remains consistent with the NRC requirements, and it was determined that it does. SCE ~~has~~ therefore resumed fuel transfer work,

loading the 30 canisters with the original basket shim design. The remaining canisters with the new design are on hold pending completion of a NRC inspection. ~~until~~ Holtec has completed~~s~~ an internal root cause evaluation. NRC issued an inspection report on November 29, 2018, and conducted a Predecisional Enforcement Conference on January 9, 2019; its enforcement determination is pending.

Another incident associated with the loading of canisters occurred in August 2018. As a canister was being lowered into the Approved ISFSI suspended from a Holtec Vertical Cask Transporter (VCT), the canister encountered an interference with the Cavity Enclosure Container divider shell and became bound in place. As a result, the downloader slings of the VCT became slack while the canister was resting only partially inside the Cavity Enclosure Container. Once aware of the situation, the VCT towers were raised to restore tension in the rigging and to raise the canister. The VCT was then adjusted, and the canister was safely lowered into the Cavity Enclosure Container. While there was no effect on the integrity of the canister or release of radioactive materials, this event placed the VCT in a configuration which defeated its ability to perform its safety function, rendering it incapable of mitigating the consequences of an accident with no redundant equipment available and operable to perform the required safety function. This event is currently under investigation by the NRC. (NRC 2018a).[1] NRC conducted a Predecisional Enforcement Conference on January 24, 2019 at which NRC staff stated that the agency anticipates making a determination within 25 days to be communicated to the public. A decision on whether to allow SCE to resume loading of SNF into the Approved ISFSI will be made after completion of the inspection process.

Issues related to the current Proposed Project include:

- **Disposition of the Unit 2 and Unit 3 offshore conduits**. Options range from abandonment in place to full removal. The Applicant proposes to partially remove conduit vertical intake and discharge structures, including 12 diffuser ports. The dispositioning of offshore conduits will be considered for approval~~ed~~ by the CSLC as part of its decision on the Proposed Project and by the CCC in its consideration of the CDP for SONGS Decommissioning.

Appendix C, *Index to Public Scoping Comments*, identifies concerns raised during the EIR scoping period, which include the Proposed Project's potential effects to the ocean environment, public access to the coast, biological resources, discharges, local/regional transportation systems, hazardous materials, public services, and air quality.

[1] For additional information, see NRC's webpage at: https://www.nrc.gov/reactors/operating/ops-experience/songs-spec-insp-activities-cask-loading-misalignment.html

ORGANIZATION OF THE EIR

The EIR is presented in nine sections as shown below.

- **Section 1.0, Introduction**, provides background on the Proposed Project and the CEQA process.
- **Section 2.0, Project Description**, describes the lease, Proposed Project components and activities, and describes the decommissioning process and schedule.
- **Section 3.0, Cumulative Projects**, identifies the projects that are analyzed for their potential cumulative effects and the EIR's approach to cumulative impact analysis.
- **Section 4.0, Environmental Impact Analysis**, describes existing environmental conditions, Proposed Project-specific impacts, mitigation measures, and residual effects for multiple environmental issue areas, and evaluates cumulative impacts.
- **Section 5.0, Project Alternatives Analysis**, describes the alternatives screening methodology, alternatives rejected from full consideration, alternatives carried forward for analysis, and analyzes impacts of each alternative carried forward.
- **Section 6.0, Other Required CEQA Sections and Environmentally Superior Alternative**, addresses other required CEQA elements, including significant and irreversible environmental and growth-inducing impacts, comparison of the Proposed Project and alternatives, and the environmentally superior alternative.
- **Section 7.0, Mitigation Monitoring Program**, describes the monitoring authority, enforcement responsibility, mitigation compliance responsibility, and general monitoring procedures, and presents the mitigation monitoring table.
- **Section 8.0, Other Commission Considerations**, presents information relevant to the CSLC's consideration of SCE's lease application for the CSLC Lease Facilities component of the Proposed Project that are in addition to the environmental review required pursuant to CEQA. The considerations include climate change and sea-level rise, commercial fishing, environmental justice, and the CSLC's Significant Lands Inventory.
- **Section 9.0, Report Preparation Sources and References**, lists the persons involved in preparation of the EIR and the reference materials used.

The ~~nine~~11 appendices are summarized below.

- **Appendix A** contains an abridged list of major federal and state laws, regulations, and policies potentially applicable to the Proposed Project organized by issue area.
- **Appendix B** contains the ~~Draft~~ EIR distribution list.

- **Appendix C** includes a copy of the NOP and comment letters received in response to the NOP.
- **Appendix D** contains appendices related to radiological hazards. (Appendices D1, D3, D4, D5, and D6~~5~~ are not directly related to analysis of the Proposed Project. They are background papers provided to maximize disclosure to the public given the highly technical and high-profile nature of nuclear power plant decommissioning.)
    - **Appendix D1, Management, Storage, Transportation, and Disposal of Spent Nuclear Fuel and High-Level Waste at San Onofre Nuclear Generating Station**, provides background information on management, storage, transportation, and disposal of SNF and HLW.
    - **Appendix D2, Radiological Scoping and Characterization Data,** presents results of a radiological scoping survey that provides information on existing onshore and offshore radiological conditions.
    - **Appendix D3, Spent Nuclear Fuel Transportation Experience and Risk Assessments,** provides background information on transportation of SNF, HLW, and radioactive materials generally.
    - **Appendix D4, Nuclear Regulatory Commission Environmental Impact Evaluation,** provides background information on federal environmental review of the decommissioning of nuclear facilities.
    - **Appendix D5, Radiation Basics,** provides background information on basic radiation concepts and human health.
    - **Appendix D6, Post-Shutdown Decommissioning Activities Report (PSDAR),** provides the plans and schedule (as of 2014) to decommission SONGS Units 2 and 3 and complete decommissioning of Unit 1 (retired in 1992). In addition, the PSDAR compared the potential environmental impacts of SONGS Decommissioning Plan activities (as analyzed in SCE's Environmental Impact Evaluation) to the NRC Final Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities Supplement (GEIS Supplement) to determine that the Proposed Project was bounded by the programmatic analysis in the GEIS Supplement. The PSDAR is subject to change as decommissioning progresses.
- **Appendix E** includes the spreadsheets used to calculate air pollutant emissions.
- **Appendix F** contains information on special-status species, photos along the offshore conduits, and the effects of sound on marine biological resources.
- **Appendix G** provides a confidential appendix containing California Historical Resources Information Center record search results for cultural resources near SONGS.

- **Appendix H** contains noise modelling outputs for the Proposed Project.
- **Appendix I** contains the SONGS Decommissioning Traffic Impact Study.
- **Appendix J** contains a list of commenters on the Draft EIR that submitted form letters.
- **Appendix K** contains the Participants comment letter Attachments B through K.

Table ES-3. Summary of Impacts and Mitigation: Proposed Project

Impact	Impact Class	Applicant Proposed Measures/ Recommended MMs
SECTION 4.1 HAZARDOUS AND RADIOLOGICAL MATERIALS		
HAZ-1: Release of Hazardous Radioactive Materials during Decommissioning and Disposal	**SU**	APM-1: Waste Management Program APM-4: Dust Suppression APM-12: Stormwater Pollution Prevention Plan (SWPPP) APM-13: Spill Prevention Control and Countermeasure (SPCC) Plan APM-14: Spill Contingency Plan
HAZ-2: Additional Emergency Response Capabilities Required During Decommissioning	**SU**	None recommended
HAZ-3: Exposure to Radioactive Groundwater Contamination	**SU**	None recommended
HAZ-4: Handling of Non-Radiological Hazardous Wastes	**LTSM**	APM-1: Waste Management Program APM-2: Hazardous Materials Business Plan MM HAZ-4: Facility Hazardous Waste Permit Extension
HAZ-5: Risk of Fire, Explosion, or Hazardous Material Release	**LTSM**	APM-1: Waste Management Program APM-12: Stormwater Pollution Prevention Plan (SWPPP) APM-13: Spill Prevention Control and Countermeasure (SPCC) Plan APM-14: Spill Contingency Plan MM HAZ-5: Worker Registration/ Certification
HAZ-6: Mobilization of Existing Contaminants	**LTSM**	APM-12: Stormwater Pollution Prevention Plan (SWPPP) MM HAZ-6: Soil and Groundwater Site Characterization Study and Soil Management Plan
SECTION 4.2 AESTHETICS		
AES-1: Affect a Scenic Vista	**B**	None recommended
AES-2: Damage Scenic Resources	**B**	None recommended
AES-3: Degrade Visual Character or Quality of Site and its Surroundings	**B**	None recommended
AES-4: Create Light and Glare	**LTS**	None recommended
SECTION 4.3 AIR QUALITY		
AQ-1: Conflict or Obstruct Implementation of Applicable Air Quality Plans	**LTS**	None recommended
AQ-2: Violation of Air Quality Standards	**LTS**	None recommended

Table ES-3. Summary of Impacts and Mitigation: Proposed Project

Impact	Impact Class	Applicant Proposed Measures/ Recommended MMs
AQ-3: Result in a Cumulatively Considerable Net Increase of Any Criteria Air Pollutant for which the Project Region is in Nonattainment	**SU**	APM-3: Vehicle Emission Reductions MM AQ-3a: Off-Road Equipment Emissions Control MM AQ-3b: Marine Vessel Emissions Control
AQ-4: Expose Sensitive Receptors to Substantial Pollutant Concentrations	**LTS**	APM-3: Vehicle Emission Reductions APM-4: Dust Suppression APM-5: Vehicle Speeds APM-6: Track-Out to Public Streets APM-7: Tarping Trucks MM AQ-3a. Off-Road Equipment Emissions Control MM AQ-3b. Marine Vessel Emissions Control
AQ-5: Create Objectionable Odors	**LTS**	None recommended
SECTION 4.4 BIOLOGICAL RESOURCES		
BIO-1: Contribute to the Loss and Degradation of Sensitive Habitat	**LTSM**	APM-4: Dust Suppression APM-12: Stormwater Pollution Prevention Plan (SWPPP) MM BIO-1a: Worker Environmental Awareness Program MM BIO-1b: ~~Habitat Restoration and Revegetation Plan~~Weed Management MM BIO-1c: Rare Plant Surveys
BIO-2: Adversely Affect Terrestrial Special-Status Species	**LTSM**	APM-4: Dust Suppression APM-8: Nesting Bird Deterrents APM-12: Stormwater Pollution Prevention Plan (SWPPP) MM BIO-1a: Worker Environmental Awareness Program MM BIO-1b: ~~Habitat Restoration and Revegetation Plan~~Weed Management MM BIO-2a: Special-Status Reptiles and Amphibians. MM BIO-2b: Surveys and Monitoring for Nesting Birds MM BIO-2c: Burrowing Owl MM BIO-2d: Western Snowy Plover/California Least Tern MM BIO-2e: Coastal California Gnatcatcher MM BIO-2f: Noise Minimization Plan
BIO-3: Disturb Non-Listed Roosting or Breeding Bats	**LTSM**	MM BIO-3: Sensitive Bat Species
BIO-4: Modify Potential Onshore U.S./Waters of the State	**LTSM**	MM BIO-4: Potential Waters of the U.S./State

Table ES-3. Summary of Impacts and Mitigation: Proposed Project

Impact	Impact Class	Applicant Proposed Measures/ Recommended MMs
BIO-5: Interfere with Established Native Resident or Migratory Wildlife Corridors	**NI**	None recommended
BIO-6: Conflict with Adopted Conservation Plans	**LTSM**	APM-4: Dust Suppression APM-8: Nesting Bird Deterrents APM-12: Stormwater Pollution Prevention Plan (SWPPP) MM BIO-1a: Worker Environmental Awareness Program MM BIO-1b: ~~Habitat Restoration and Revegetation Plan~~Weed Management MM BIO-2a: Special-Status Reptiles and Amphibians MM BIO-2b: Surveys and Monitoring for ~~Breeding~~ Nesting Birds MM BIO-2c: Burrowing Owl MM BIO-2d: Western Snowy Plover/California Least Tern MM BIO-2e: Coastal California Gnatcatcher MM BIO-2f: Noise Minimization Plan MM BIO-4: Potential ~~Onshore~~Waters of the U.S./State
BIO-7: Contribute to the Degradation of Marine Habitats	**LTS**	APM-1: Waste Management Program APM-12: Stormwater Pollution Prevention Plan (SWPPP) APM-17: Offshore Spill Response Plan
BIO-8: Risk of Oil Spill Mortality to Protected Marine Species	**LTS**	APM-17: Offshore Spill Response Plan
BIO-9: Release of H_2S Gas from Intake and Discharge Conduits	**LTSM**	MM BIO-9: Hydrogen Sulfide (H_2S) Gas Control Plan
BIO-10: Seabed Disturbance, Dredging, and Debris Accumulation	**LTSM**	APM-9: Conduit Work Plan APM-15: Dredging Plan APM-16: Turbidity Monitoring MM BIO-10: Anchoring Plan
BIO-11: Harassment of Marine Life	**LTSM**	MM BIO-11: Marine Mammal and Sea Turtle Mitigation and Monitoring Plan
BIO-12: Spread of Invasive and Non-Native Marine Species	**LTSM**	MM BIO-12: Invasive Non-Native Aquatic Species (NAS)
SECTION 4.5 CULTURAL AND PALEONTOLOGICAL RESOURCES		
CR-1: Change Significance of Previously Recorded Historical or Unique Archaeological Resources	**NI**	None recommended

Table ES-3. Summary of Impacts and Mitigation: Proposed Project

Impact	Impact Class	Applicant Proposed Measures/ Recommended MMs
CR-2: Change Significance of Previously Unidentified Historical or Unique Archaeological Resources	**LTSM**	APM-10: Cultural Resources Protection MM CR/TCR-2a: Archaeological and Tribal Monitoring MM CR/TCR-2b: Unanticipated Cultural/Tribal Cultural Resources MM CR/TCR-2c: Cultural Resource Identification during Offshore Geophysical Surveys
CR-3: Disturb Unidentified Human Remains	**LTS**	APM-11: Appropriate Treatment of Human Remains
CR-4: Destruction of Unique Paleontological Resources	**LTSM**	MM CR-4a: Paleontological Monitoring MM CR-4b: Unanticipated Paleontological Resources
SECTION 4.6 CULTURAL RESOURCES - TRIBAL		
TCR-1: Change Significance of Previously Recorded Tribal Cultural Resources	**NI**	None recommended
TCR-2: Change Significance of Previously Unidentified Tribal Cultural Resources	**LTSM**	APM-10: Cultural Resources Protection APM-11: Appropriate Treatment of Human Remains MM CR/TCR-2a: Archaeological and Tribal Monitoring MM CR/TCR-2b: Unanticipated Cultural/Tribal Resources MM CR/TCR-2c: Cultural Resource Identification during Offshore Geophysical Surveys
TCR-3: Disturb Unidentified Tribal Human Remains	**LTS**	APM-11: Appropriate Treatment of Human Remains
SECTION 4.7 GEOLOGY, SOILS, AND COASTAL PROCESSES		
GEO/CP-1: Construction Triggered Landslides	**NI**	None recommended
GEO/CP-2: Construction Triggered Erosion	**LTS**	APM-12: Stormwater Pollution Prevention Plan (SWPPP)
GEO/CP-3: Impaired Coastal Sediment Properties	**LTS**	None recommended
GEO/CP-4: Degraded Water Wave, Current, or Circulation Patterns	**LTS**	None recommended
GEO-CP-5: Increased Tsunami Threat	**NI**	None recommended
SECTION 4.8 GREENHOUSE GAS EMISSIONS		
GHG-1: GHG Emissions from Proposed Project Activities	**LTS**	None recommended
GHG-2: Compliance with GHG Emission Reduction Plans, Policies, or Regulations	**LTS**	None recommended

Table ES-3. Summary of Impacts and Mitigation: Proposed Project

Impact	Impact Class	Applicant Proposed Measures/ Recommended MMs
SECTION 4.9 HYDROLOGY AND WATER QUALITY		
WQ-1 Violation of Water Quality Standards or Waste Discharge Requirements, or Generation of Substantial Additional Sources of Polluted Runoff	**LTS**	APM-1: Waste Management Program APM-2: Hazardous Materials Business Plan APM-12: Stormwater Pollution Prevention Plan (SWPPP) APM-13: Spill Prevention Control and Countermeasure (SPCC) Plan APM-14: Spill Contingency Plan
WQ-2: Groundwater Characterization and Discharge	**LTSM**	MM HAZ-6: Soil and Groundwater Site Characterization Study and Soil Management Plan
WQ-3: Groundwater Depletion or Reduced Recharge	**LTS**	None recommended
WQ-4: Erosion or Siltation due to Altered Drainage Patterns	**LTSM**	APM-12: Stormwater Pollution Prevention Plan (SWPPP) MM WQ-4: ~~Interim Erosion Control Plan~~Onshore Site Stabilization Plan
WQ-5: Flooding due to Altered Drainage Patterns or Increased Surface Runoff	**LTSM**	MM WQ-5: Walkway Flood Protection Plan
WQ-6: Increased Ocean Turbidity and Marine Debris	**LTS**	APM-1: Waste Management Program APM-15: Dredging Plan APM-16: Turbidity Monitoring
WQ-7: Degraded Marine Water Quality from Oil and Chemical Spills	**LTS**	APM-17: Offshore Spill Response Plan
SECTION 4.10 LAND USE AND PLANNING		
LU-1: Consistency with Applicable Land Use Plans, Policies, or Regulations	**NI**	None recommended
LU-2: Disrupt, Displace, or Divide Existing or Approved Land Uses	**LTSM**	MM LU-2a: Deconstruction Liaison MM LU-2b: Advance Notification of Deconstruction MM LU-2c: Quarterly Deconstruction Updates
SECTION 4.11 NOISE		
NOI-1: Expose Sensitive Receptors to Onshore Noise Levels in Excess of Standards	**LTS**	None recommended
NOI-2: Expose Sensitive Receptors to Excessive Groundborne Vibration or Groundborne Noise	**LTS**	None recommended
NOI-3: Substantial Temporary or Periodic Increase in Ambient Noise Levels at Sensitive Receptors	**LTS**	None recommended

Table ES-3. Summary of Impacts and Mitigation: Proposed Project

Impact	Impact Class	Applicant Proposed Measures/ Recommended MMs
NOI-4: Create Excessive Underwater Noise	**LTS**	None recommended
SECTION 4.12 RECREATION AND PUBLIC ACCESS		
REC-1: Reduction of Public Access to Recreational Facilities	**LTSM**	APM-18: Notification to Local Mariners MM REC-1a: Public Notification MM REC-1b: Public Access Plan
REC-2: Increased Use of Existing Local and Regional Parks or other Recreational Facilities	**LTS**	None recommended
REC-3: Create Hazards for Recreationists	**LTSM**	APM-18: Notification to Local Mariners MM REC-1a: Public Notification
SECTION 4.13 TRANSPORTATION AND TRAFFIC		
TR-1: Reduce Local Transportation and Circulation	**LTS**	APM-19: Emergency Services Access APM-20: Oversize/Overweight Loads MM REC-1b: Public Access Plan
TR-2: Reduce Pedestrian and Bicycle Rider Safety	**LTSM**	APM-21: Pedestrian and Bicycle Access and Safety MM REC-1a: Public Notification
TR-3: Limit Rail Operations	**LTS**	None recommended
TR-4: Reduce Driveway Safety or Require New Traffic Signals	**LTS**	None recommended
TR-5: Reduce Marine Vessel Safety	**LTS**	APM-9: Conduit Work Plan APM-15: Dredging Plan APM-18: Notification to Local Mariners APM-22: Private Aids to Navigation
SECTION 4.14 UTILITIES AND PUBLIC SERVICE SYSTEMS		
USS-1: New or Altered Public Services or Government Facilities	**LTS**	None recommended
USS-2: Exceed Wastewater Treatment Requirements or Capacity	**LTS**	None recommended
USS-3: Exceed Existing Water Supplies	**LTS**	None recommended
USS-4: Exceed Landfill Capacity	**LTS**	None recommended
USS-5: Conflict with Applicable Solid Waste Statutes and Regulations	**NI**	None recommended

Table ES-3. Summary of Impacts and Mitigation: Proposed Project

Impact	Impact Class	Applicant Proposed Measures/ Recommended MMs

Notes: [1] Impacts are classified as according to one of the following five categories:

- SU (Significant and Unavoidable): a substantial or potentially substantial adverse change from the environmental baseline that meets or exceeds significance criteria, where either no feasible mitigation can be implemented or the impact remains significant after implementation of mitigation measures
- LTSM (Less than Significant with Mitigation): a substantial or potentially substantial adverse change from the environmental baseline that can be avoided or reduced to below applicable significance thresholds
- LTS (Less than Significant): an adverse impact that does not meet or exceed the significance criteria of a particular resource area and, therefore, does not require mitigation
- B (Beneficial): an impact that would result an improvement to the physical environment relative to baseline conditions
- NI (No Impact): a Project change that would not result in an impact to the physical environment relative to baseline conditions

Table ES-4. Summary of Impacts: Proposed Project and Alternatives

Impact	Impact Class[1]				
	Proposed Project	No Project	Offshore Conduit Removal		Removal of Onshore Subsurface Structures
			Full	Partial	
SECTION 4.1 HAZARDOUS AND RADIOLOGICAL MATERIALS					
HAZ-1: Release of Hazardous Radioactive Materials During Decommissioning and Disposal	SU	SU	SU	SU	SU
HAZ-2: Additional Emergency Response Capabilities Required During Decommissioning	SU	SU	SU	SU	SU
HAZ-3: Exposure to Radioactive Groundwater Contamination	SU	SU	SU	SU	SU
HAZ-4: Handling of Non-Radiological Hazardous Wastes	LTSM	LTSM	LTSM	LTSM	LTSM
HAZ-5: Risk of Fire, Explosion, or Hazardous Material Release	LTSM	LTSM	LTSM	LTSM	LTSM
HAZ-6: Mobilization of Existing Contaminants	LTSM	LTSM	LTSM	LTSM	LTSM
SECTION 4.2 AESTHETICS					
AES-1: Affect a Scenic Vista	B	B	B	B	B
AES-2: Damage Scenic Resources	B	B	B	B	B
AES-3: Degrade Visual Character or Quality of Site and its Surroundings	B	B	B	B	B
AES-4: Create Light and Glare	LTS	LTS	LTS	LTS	LTS
SECTION 4.3 AIR QUALITY					
AQ-1: Conflict or Obstruct Implementation of Applicable Air Quality Plans	LTS	LTS	LTS	LTS	LTS
AQ-2: Violation of Ambient Air Quality Standards	LTS	LTS	LTS	LTS	LTS
AQ-3: Result in a Cumulatively Considerable Net Increase in Any Criteria Air Pollutant for which the Project Region is in Nonattainment	SU	SU	SU	SU	SU
AQ-4: Expose Sensitive Receptors to Substantial Pollutant Concentrations	LTS	LTS	LTS	LTS	LTS
AQ-5: Create Objectionable Odors Affecting a Substantial Number of People	LTS	LTS	LTS	LTS	LTS
SECTION 4.4 BIOLOGICAL RESOURCES					
BIO-1: Contribute to the Loss and Degradation of Sensitive Habitat	LTSM	LTSM	LTSM	LTSM	LTSM
BIO-2: Adversely Affect Terrestrial Special-Status Species	LTSM	LTSM	LTSM	LTSM	LTSM

Table ES-4. Summary of Impacts: Proposed Project and Alternatives

Impact	Impact Class[1]				
	Proposed Project	No Project	Offshore Conduit Removal		Removal of Onshore Subsurface Structures
			Full	Partial	
BIO-3: Disturb Non-Listed Roosting or Breeding Bats	LTSM	LTSM	LTSM	LTSM	LTSM
BIO-4: Potential Disturbance or Degradation of Onshore Waters of the U.S./State	LTSM	LTS	LTS	LTS	LTS
BIO-5: Interfere with Established Native Resident or Migratory Wildlife Corridors	NI	NI	NI	NI	NI
BIO-6: Conflict with Adopted Conservation Plans	LTSM	LTSM	LTSM	LTSM	LTSM
BIO-7: Contribute to the Degradation of Marine Habitats	LTS	LTS	LTS	LTS	LTS
BIO-8: Risk of Oil Spill Mortality to Protected Marine Species	LTS	NI	LTS	LTS	LTS
BIO-9: Release of Hydrogen Sulfide (H_2S) Gas from Intake and Discharge Conduits	LTSM	NI	LTSM	LTSM	LTSM
BIO-10: Seabed Disturbance, Dredging, and Debris Accumulation	LTSM	NI	SU	SU	LTSM
BIO-11: Harassment of Marine Life	LTSM	NI	LTSM	LTSM	LTSM
BIO-12: Spread of Invasive and Non-Native Marine Species	LTSM	NI	LTSM	LTSM	LTSM
SECTION 4.5 CULTURAL AND PALEONTOLOGICAL RESOURCES					
CR-1: Change Significance of Previously Recorded Historical, Unique Archaeological Resources	NI	NI	NI	NI	NI
CR-2: Change Significance of Previously Unidentified Historical or Unique Archaeological Resources	LTSM	LTSM	LTSM	LTSM	LTSM
CR-3: Disturb Unidentified Human Remains	LTS	LTS	LTS	LTS	LTS
CR-4: Destruction of Unique Paleontological Resources	LTSM	LTSM	LTSM	LTSM	LTSM
SECTION 4.6 CULTURAL RESOURCES - TRIBAL					
TCR-1: Change Significance of Previously Recorded Tribal Cultural Resources	NI	NI	NI	NI	NI
TCR-2: Change Significance of Previously Unidentified Tribal Cultural Resources	LTSM	LTSM	LTSM	LTSM	LTSM
TCR-3: Disturb Unidentified Tribal Human Remains	LTS	LTS	LTS	LTS	LTS
SECTION 4.7 GEOLOGY, SOILS, AND COASTAL PROCESSES					
GEO/CP-1: Construction Triggered Landslides	NI	NI	NI	NI	NI
GEO/CP -2: Construction Triggered Erosion	LTS	LTS	LTS	LTS	LTS
GEO/CP-3: Impaired Coastal Sediment Properties	LTS	NI	NI	LTS	LTS

Table ES-4. Summary of Impacts: Proposed Project and Alternatives

Impact	Impact Class[1]				
	Proposed Project	No Project	Offshore Conduit Removal		Removal of Onshore Subsurface Structures
			Full	Partial	
GEO/CP-4: Degraded Water Wave, Current, or Circulation Patterns	**LTS**	**NI**	**LTS**	**LTS**	**LTS**
GEO/CP-5: Increased Tsunami Threat	**NI**	**NI**	**NI**	**NI**	**NI**
SECTION 4.8 GREENHOUSE GAS EMISSIONS					
GHG-1: GHG Emissions from Proposed Project Activities	**LTS**	**LTS**	**LTS**	**LTS**	**LTS**
GHG-2: Compliance with GHG Emission Reduction Plans, Policies, or Regulations	**LTS**	**LTS**	**LTS**	**LTS**	**LTS**
SECTION 4.9 HYDROLOGY AND WATER QUALITY					
WQ-1: Violation of Water Quality Standards or Waste Discharge Requirements, or Generation of Substantial Additional Sources of Polluted Runoff	**LTS**	**LTS**	**LTS**	**LTS**	**LTS**
WQ-2: Groundwater Characterization and Discharge	**LTSM**	**LTSM**	**LTSM**	**LTSM**	**LTSM**
WQ-3: Groundwater Depletion or Reduced Recharge	**LTS**	**LTS**	**LTS**	**LTS**	**LTS**
WQ-4: Erosion or Siltation due to Altered Drainage Patters	**LTSM**	**LTSM**	**LTSM**	**LTSM**	**LTSM**
WQ-5: Flooding due to Altered Drainage Patterns or Increased Surface Runoff	**LTSM**	**LTSM**	**LTSM**	**LTSM**	**LTSM**
WQ-6: Increased Ocean Turbidity and Marine Debris	**LTS**	**NI**	**LTS**	**LTS**	**LTS**
WQ-7: Degraded Marine Water Quality from Oil or Chemical Spills	**LTS**	**LTS**	**LTS**	**LTS**	**LTS**
SECTION 4.10 LAND USE AND PLANNING					
LU-1: Consistency with Applicable Land Use Plans, Policies, or Regulations	**NI**	**NI**	**NI**	**NI**	**NI**
LU-2: Disrupt, Displace, or Divide Existing or Approved Land Uses	**LTSM**	**LTSM**	**LTSM**	**LTSM**	**LTSM**
SECTION 4.11 NOISE					
NOI-1: Expose Sensitive Receptors to Onshore Noise Levels in Excess of Standards	**LTS**	**LTS**	**LTS**	**LTS**	**LTS**
NOI-2: Expose Sensitive Receptors to Excessive Groundborne Vibration or Groundborne Noise	**LTS**	**LTS**	**LTS**	**LTS**	**LTS**
NOI-3: Substantial Temporary or Periodic Increase in Ambient Noise Levels at Sensitive Receptors	**LTS**	**LTS**	**LTS**	**LTS**	**LTS**
NOI-4: Create Excessive Underwater Noise	**LTS**	**NI**	**LTSM**	**LTSM**	**LTS**

Table ES-4. Summary of Impacts: Proposed Project and Alternatives

Impact	Impact Class[1]				
	Proposed Project	No Project	Offshore Conduit Removal		Removal of Onshore Subsurface Structures
			Full	Partial	
SECTION 4.12 RECREATION AND PUBLIC ACCESS					
REC-1: Reduction of Public Access to Recreational Facilities	**LTSM**	**NI**	**LTSM**	**LTSM**	**LTSM**
REC-2: Increased Use of Existing Local and Regional Parks or Other Recreational Facilities	**LTS**	**LTS**	**LTS**	**LTS**	**LTS**
REC-3: Create Hazards for Recreationists	**LTSM**	**LTSM**	**LTSM**	**LTSM**	**LTSM**
SECTION 4.13 TRANSPORTATION AND TRAFFIC					
TR-1: Reduction of Local Transportation and Circulation	**LTS**	**LTS**	**LTS**	**LTS**	**LTS**
TR-2: Reduce Pedestrian and Bicycle Rider Safety	**LTSM**	**LTSM**	**LTSM**	**LTSM**	**LTSM**
TR-3: Limit Rail Operations	**LTS**	**LTS**	**LTS**	**LTS**	**LTS**
TR-4: Reduce Driveway Safety or Require New Traffic Signals	**LTS**	**LTS**	**LTS**	**LTS**	**LTS**
TR-5: Marine Vessel Safety	**LTS**	**NI**	**LTS**	**LTS**	**LTS**
SECTION 4.14 UTILITIES AND PUBLIC SERVICE SYSTEMS					
USS-1: New or Altered Public Services or Government Facilities	**LTS**	**LTS**	**LTS**	**LTS**	**LTS**
USS-2: Exceed Wastewater Treatment Requirements or Capacity	**LTS**	**LTS**	**LTS**	**LTS**	**LTS**
USS-3: Exceed Existing Water Supply	**LTS**	**LTS**	**LTS**	**LTS**	**LTS**
USS-4: Exceed Landfill Capacity	**LTS**	**LTS**	**LTS**	**LTS**	**LTS**
USS-5: Conflict with Applicable Solid Waste Statutes and Regulations	**NI**	**NI**	**NI**	**NI**	**NI**

Notes: [1] Impacts are classified as according to one of the following five categories:

- SU (Significant and Unavoidable): a substantial or potentially substantial adverse change from the environmental baseline that meets or exceeds significance criteria, where either no feasible mitigation can be implemented or the impact remains significant after implementation of mitigation measures
- LTSM (Less than Significant with Mitigation): a substantial or potentially substantial adverse change from the environmental baseline that can be avoided or reduced to below applicable significance thresholds
- LTS (Less than Significant): an adverse impact that does not meet or exceed the significance criteria of a particular resource area and, therefore, does not require mitigation
- B (Beneficial): an impact that would result an improvement to the physical environment relative to baseline conditions
- NI (No Impact): a Project change that would not result in an impact to the physical environment relative to baseline conditions

1.0 INTRODUCTION

1.1 PROPOSED PROJECT BACKGROUND AND LOCATION

In December 2017, Southern California Edison Company (SCE), San Diego Gas & Electric Company (SDG&E), and the City of Riverside (collectively, **Applicant**) submitted an updated project description to the California State Lands Commission (Commission or CSLC) to decommission the portions of San Onofre Nuclear Generating Station (SONGS) Units 2 and 3 authorized by CSLC Lease No. PRC 6785.1 (hereinafter "**CSLC Lease Facilities**").[2] The SONGS facility occupies lands owned by the U.S. Department of Navy (DoN) and CSLC on the north San Diego County coast, approximately 50 miles north-northwest of the city of San Diego (Figures 1-1 and 1-2). The nearest city is San Clemente in Orange County, 5 miles north-northwest of SONGS. The CSLC Lease Facilities are: SONGS Units 2 and 3 offshore intake and discharge conduits; riprap along the shore seaward of the ordinary high-water mark; and five offshore buoys. Disposition of the CSLC Lease Facilities is part of the larger, long-term plan to decommission SONGS (hereinafter "**SONGS Decommissioning Plan**"), which has three components:

- **Approved Independent Spent Fuel Storage Installation (Approved ISFSI) ~~Expansion,~~ Operation~~,~~ and Maintenance (2015 through 2035)**
- **Proposed Project (2019 through 2028)** (the project – as defined in California Environmental Quality Act [CEQA], § 21065 and State CEQA Guidelines, § 15378 – that is analyzed in this Environmental Impact Report [EIR])[3]
- **Future Activities (estimated to begin in 2035)** (SONGS Decommissioning will continue to occur over decades with currently scheduled completion in 2051)

The CSLC is the CEQA lead agency for the Proposed Project, and this EIR provides agencies and the public with detailed information about the potentially significant effects which the Proposed Project is likely to have on the environment, and identifies potentially feasible mitigation measures and alternatives that will avoid or substantially lessen those significant effects~~; to list ways in which the significant effects of such a project might be minimized; and to indicate alternatives to the Proposed Project~~ (see Section 1.5, *Purpose and Scope of EIR*).

[2] SONGS is owned and was operated by SCE, SDG&E, and the cities of Riverside and Anaheim (collectively, **Participants**). The City of Anaheim is not currently a party to CSLC Lease No. PRC 6785.1. The application submitted to the CSLC consists of the updated project description (2017), supplement to original application (2016), and original application (2015).

[3] CEQA and the State CEQA Guidelines are found in Public Resources Code section 21000 et seq. and California Code of Regulations, title 14, section 15000 et seq., respectively.

Figure 1-1. Site Location

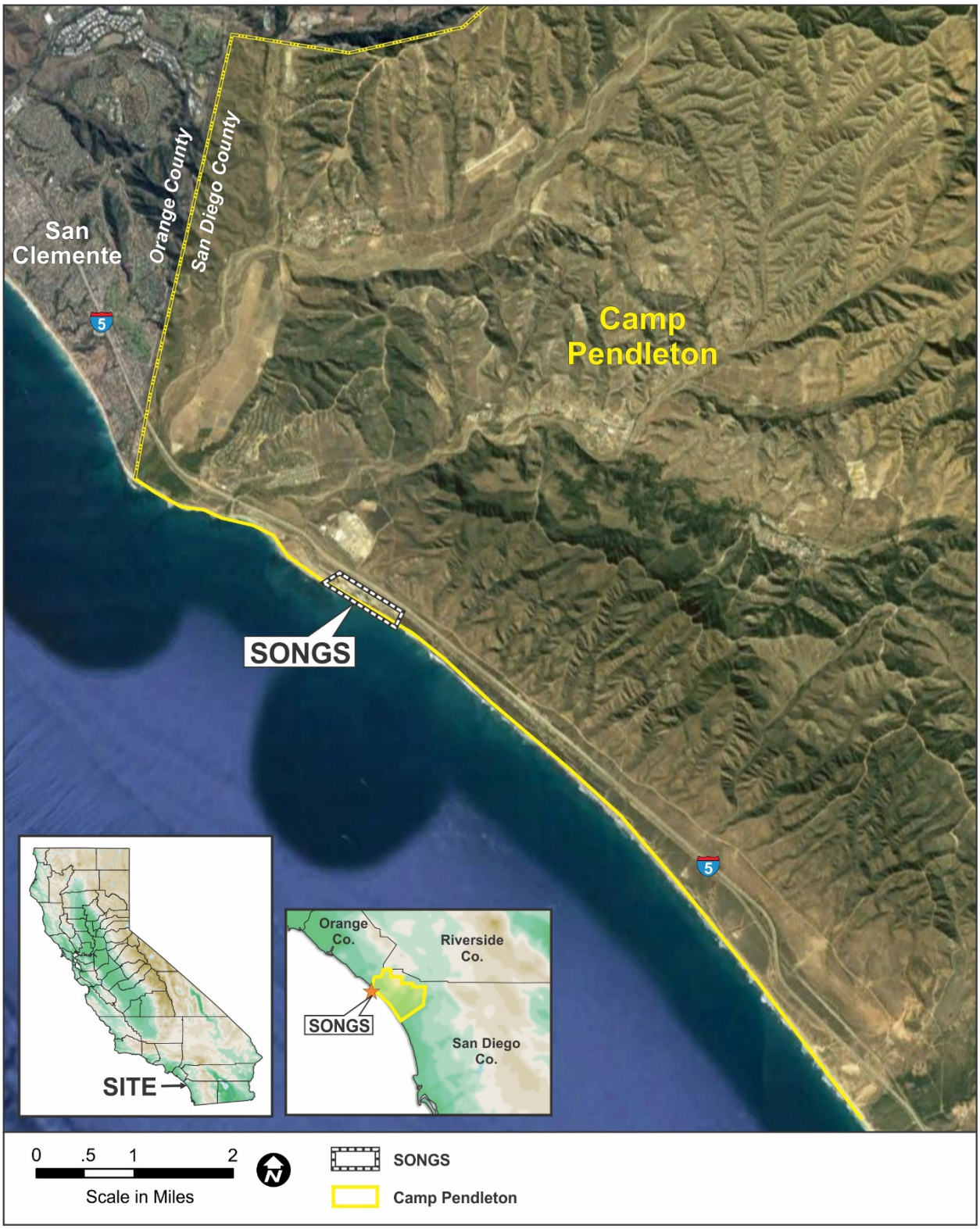
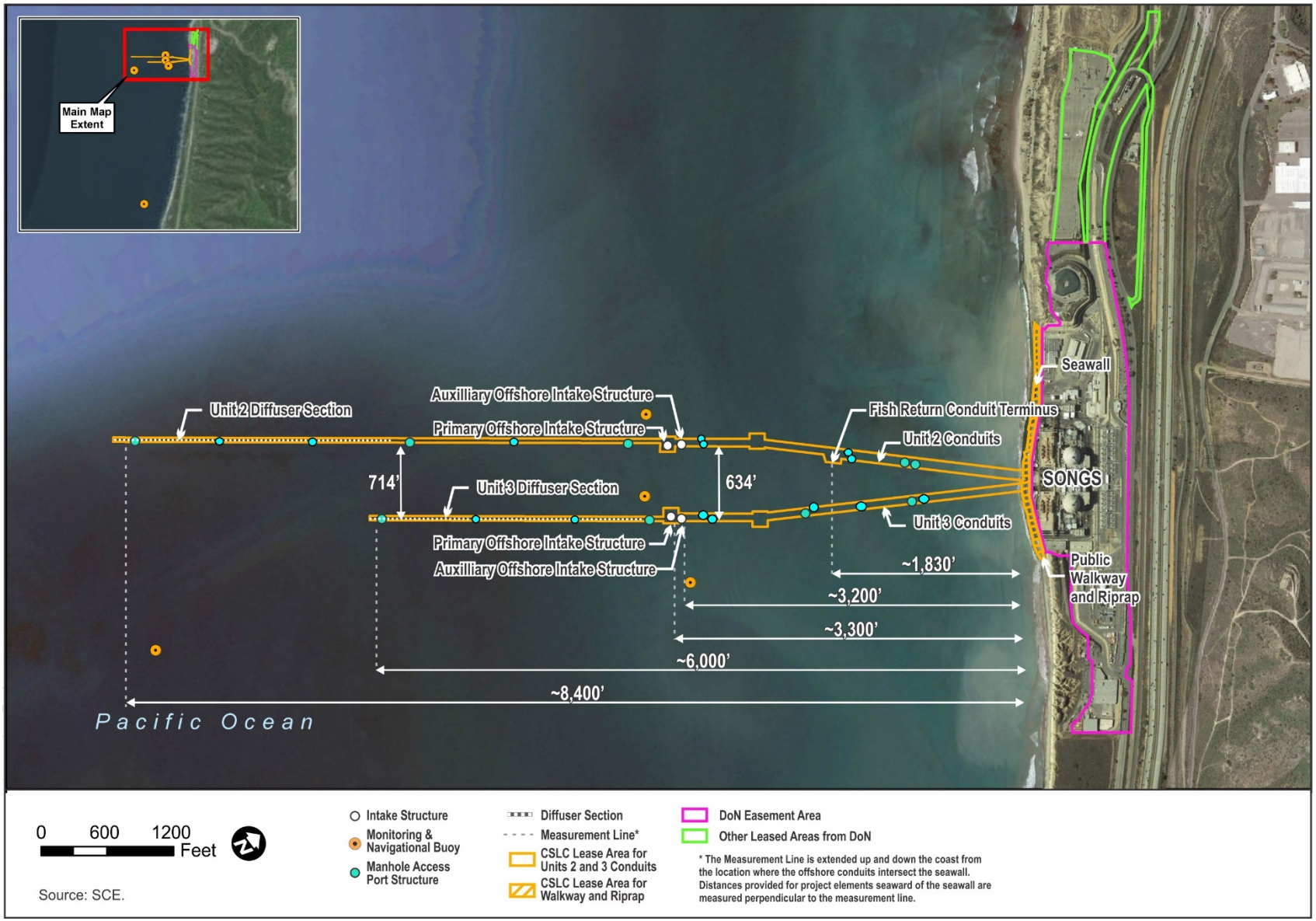


Figure 1-2. DoN / CSLC Lease Easement Areas



The Approved ISFSI ~~Expansion,~~ Operation~~,~~ and Maintenance component of the SONGS Decommissioning Plan is ~~distinguished~~ separate and independent from the Proposed Project because the AREVA facility was already existing and the California Coastal Commission (CCC) approved Coastal Development Permit (CDP) No. 9-15-0228 in 2015 to ~~expand the existing ISFSI~~ construct the Holtec facility portion of the Approved ISFSI to accommodate all remaining spent nuclear fuel (SNF) at SONGS and to require the Participants to return to the CCC in 2035 to authorize the retention, removal, or relocation of the Approved ISFSI (see Table 1-1 and Section 1.5.1, *Baseline and Future Conditions*). Per the Applicant, the construction of the Holtec facility was completed on January 19, 2018.

Table 1-1. SONGS Decommissioning Plan Elements Not Analyzed in this EIR

Decommissioning Plan Components	Rationale
Approved ISFSI (2015-2035). This component comprises the ~~expansion,~~ operation~~,~~ and maintenance of the ~~a~~Approved ISFSI (inclusive of both AREVA and Holtec facilities) and the storage of SNF on-site, consistent with CCC CDP No. 9-15-0228. Construction of the ~~expanded ISFSI~~ Holtec facility was completed on January 19, 2018, and the loading and transfer of the first spent fuel canister to the ~~expanded ISFSI~~ the Holtec facility occurred on January 22, 2018.[1] Transfer of all SNF to dry cask storage is scheduled to be completed by mid-2019 or earlier.	Storage of SNF and operational and radiological aspects of the Approved ISFSI in the coastal zone fall under the exclusive jurisdiction of the NRC. The CCC found these activities, which are not subject to CSLC jurisdiction, to be consistent with the Coastal Act as part of a separate project action independent of the Proposed Project. These activities, therefore, are part of the baseline for the Proposed Project (see Section 1.2.2.2, *California Coastal Commission*, Section 1.5.1, *Baseline and Future Conditions*, and Appendix D).[3]
Future Activities (~ 2035):[2] This component comprises additional substructure removal and final site restoration activities that cannot be defined at this time, including: • Abandonment of Unit 2 discharge conduit • Removal of remaining discharge conduit diffuser ports • Off-site transport of SNF • Approved ISFSI dismantlement • Final disposition of shoreline structures (seawall, walkway, and riprap) after the Approved ISFSI is removed • Removal of additional subsurface material onshore (Units 1, 2, and 3) if required by DoN • Final site restoration onshore pursuant to federal landowner (DoN) requirements	As discussed in Section 1.5.2, *Uncertainty Regarding Future Decommissioning Plan Activities*, the Participants cannot define the nature of the Future Activities until the details and timing of SNF disposition are determined. These Future Activities, which require future review under the California Coastal Act (Pub. Resources Code, § 30000 et seq.), CEQA, and NEPA, are disclosed based on the best available information to date or reasonable assumptions as to anticipated activities.

Acronyms: CCC = California Coastal Commission; CDP = coastal development permit; DoN = U.S. Department of the Navy; ISFSI = Independent Spent Fuel Storage Installation; NEPA = National Environmental Policy Act; NRC = U.S. Nuclear Regulatory Commission; SNF = spent nuclear fuel.

Notes:

[1] 50 canisters of SNF were previously transferred from spent fuel pools to the existing dry cask storage.

[2] Future activities could begin before 2035 an interim storage facility or a permanent repository becomes available to store or dispose of SNF and the designated federal agencies approve the transport of SONGS SNF offsite.

[3] For further information on impacts associated with the SONGS Approved ISFSI and SNF storage, refer to the CCC staff report for CDP No. 9-15-0228. Appendix D4 identifies hazards associated with the Approved ISFSI.

The geographic scope of this EIR covers both onshore and offshore actions, not just decommissioning activities involving the CSLC Lease Facilities. Activities associated with the Approved ISFSI and the Future Activities components of the Participants' SONGS Decommissioning Plan are disclosed in this EIR for informational purposes, but are not analyzed ~~to the same level as~~ as part of the Proposed Project ~~activities~~ for the reasons identified in Table 1-1 above. For the purposes of the CSLC's CEQA review, the EIR analysis focuses on the Proposed Project activities between 2019 and 2028, presented in Section 2.0, *Project Description*:

- **Decontamination and Dismantlement (D&D)** of most onshore above-grade structures, including the containment buildings (domes), in accordance with U.S. Nuclear Regulatory Commission (NRC) requirements and landowner lease terms
- ~~**Conduit Disposition**~~**CSLC Lease Offshore Activities**, ~~which~~ covers the dispositioning of SONGS Units 2 and 3 offshore intake and discharge conduits and associated structures ~~on the~~ that are part of the CSLC Lease ~~Premises~~Facilities

1.2 LEGAL AND GOVERNMENTAL AUTHORITY

1.2.1 Federal

1.2.1.1 U.S. Department of Navy/Marine Corps Base Camp Pendleton

The DoN-owned land where decommissioning-related work would occur includes an approximately 84-acre easement for the primary nuclear facilities (DoN Easement); two leased parcels adjacent to the DoN Easement, including parking lots and laydown/storage land comprising approximately 15 acres; and easements for an access road and rail spur (Onshore Site). The Onshore Site lies within the boundaries of the Marine Corps Base Camp Pendleton (MCBCP) under real estate agreements (easements and leases) between the DoN and the Participants that allow for SONGS construction, operation, and decommissioning (see Figure 2-1). Onshore decommissioning would occur on about 99 acres of DoN-owned land (DoN Property): (1) an 84-acre easement for the primary nuclear facilities (DoN Easement); (2) two leased parcels adjacent to the DoN Easement, including laydown/storage land and parking lots comprising approximately 15 acres; and (3) easements for an access road and rail spur. Prior to the expiration date of these easements and leases (in 2023 and 2024), the Participants intend to seek an extension of the terms to allow for the continued right to occupy the land until decommissioning is complete. The DoN would conduct an environmental review pursuant to the National Environmental Policy Act (NEPA) ~~at the time of federal lease termination, before deciding~~

~~the amount of any additional onshore substructure removal and final restoration requirements for the areas in its jurisdiction~~ as part of its decision-making processes associated with the easement extension and any future end-state decisions.

1.2.1.2 U.S. Nuclear Regulatory Commission

The NRC has complete oversight and compliance authority over the decommissioning of U.S. nuclear power plants, including management and safe storage of SNF until it can feasibly be moved off-site (10 Code of Federal Regulations [CFR] Part 72 Subpart K, § 72.210; see also Section 1.2.1.3, *Federal Preemption*, below). During decommissioning and until the Participants' NRC license is terminated, the NRC is also responsible for on-going inspection and monitoring of all liquid and airborne radiological releases at SONGS; any such releases must be maintained below the same radiological limits as when the plant was in operation. Pursuant to NRC regulations, decommissioning of SONGS must be completed within 60 years after operations permanently cease, unless the NRC approves an extension. NRC (2017a) states:

> *When a power company decides to close a nuclear power plant permanently, the facility must be decommissioned by safely removing it from service and reducing residual radioactivity to a level that permits release of the property and termination of the operating license. The NRC has strict rules governing nuclear power plant decommissioning, involving cleanup of radioactively contaminated plant systems and structures and removal of the radioactive fuel. These requirements protect workers and the public during the entire decommissioning process and protect the public after the license is terminated.* (NUREG/BR–0521; see also 10 CFR Part 50.2).

In 2002, the NRC prepared, pursuant to NEPA, a Final Generic Environmental Impact Statement (GEIS) on Decommissioning of Nuclear Facilities Supplement (GEIS Supplement; NUREG-0586) to analyze environmental impacts associated with the decommissioning of nuclear power plants throughout the country.[4] Prior to conducting any major decommissioning activity, licensees must demonstrate in a Post Shutdown Decommissioning Activities Report (PSDAR) submittal that the environmental impacts associated with each particular nuclear power plant decommissioning effort are bounded by (i.e., fall within) the impacts evaluated in the 2002 GEIS Supplement or other previously issued environmental assessment or EIS, or additional NEPA review would be necessary. The status of the Participants' PSDAR is discussed below (for additional information on the NRC environmental impact evaluation process, see Appendix D4).

- On September 23, 2014, the Participants submitted its PSDAR (SCE 2014a) to the NRC (provided as Appendix D6). The PSDAR included the plans and schedule to decommission SONGS Units 2 and 3 and complete decommissioning of Unit 1

[4] The environmental impacts described in the NRC (2002) GEIS Supplement supersede those described in a prior GEIS (NRC 1988a) and is considered a stand-alone document such that readers should not need to refer back to the NRC (1988a) GEIS; see www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr0586/.) The GEIS Supplement is incorporated by reference in this EIR.

(retired in 1992), ~~assessed~~ compared potential environmental impacts of SONGS Decommissioning Plan activities (as analyzed in SCE's 2014 Environmental Impact Evaluation)~~,~~ to the NRC's GEIS Supplement and concluded that these impacts are bounded by the NRC's GEIS Supplement. The Participants also submitted an Irradiated Fuel Management Plan (IFMP) for Units 1, 2, and 3, that summarized the plans for managing SNF on-site pending eventual transfer of the SNF for interim storage or permanent disposal (SCE 2014b).

- On August 19, 2015, the NRC (2015a) found that the IFMP contained adequate information and complied with applicable federal requirements.
- On August 20, 2015, the NRC (2015b) found that SCE's PSDAR contained all the information required under 10 CFR Part 50.82 to proceed with decommissioning. The NRC accepted the PSDAR analysis conclusion that potential environmental impacts of the SONGS Decommissioning Plan activities are bounded by the 2002 GEIS Supplement and determined, based on the Proposed Project scope, that no further NEPA review is needed for SONGS decommissioning to proceed. SCE will update the PSDAR and IFMP as needed during decommissioning (SCE 2016c).

1.2.1.3 Federal Preemption

The NRC's exclusive jurisdiction over the radiological aspects of decommissioning preempts states from imposing any regulatory requirements related to radiation hazards or nuclear safety. (See *Pacific Gas and Electric Company v. State Energy Commission*, 461 U.S. 190, 103 S.Ct. 1713 (1983).) SCE is required by its NRC operating license to implement detailed plans and procedures to ensure that radiological releases are minimized or avoided. These plans and procedures (both those that are completed and those that will not be final until later in the process) are, due to federal preemption, outside the CSLC's authority. (See *Pacific Gas and Electric Company v. State Energy Commission*, 461 U.S. 190 at 211-212.)

The CSLC is also subject to this "federal preemption" over issues concerning the handling, storage, transport, disposal, and monitoring of SNF and high-level radioactive waste (HLW). For example, the Nuclear Waste Policy Act (NWPA) of 1982, as amended (42 United States Code [U.S.C.] chapter 108), in part:

- establishes federal policy for the siting, construction, and operation of repositories "that will provide a reasonable assurance that the public and the environment will be adequately protected from the hazards posed by high-level radioactive waste and such spent nuclear fuel as may be disposed of in a repository" (42 U.S.C. § 10131 (b)(1))
- establishes the federal responsibility, and a definite federal policy, for the disposal of HLW and SNF

- defines the relationship between the federal and state governments with respect to the disposal of HLW and SNF.

Pursuant to the NWPA, the U.S. Department of Energy (DOE) is responsible for identifying, characterizing, selecting, and developing repositories suitable for interim storage or off-site permanent disposal of SNF. This process has not been completed.[5] In 1983, SCE, acting on its own behalf and as an agent for the SONGS Participants, entered into a Standard Contract with the Secretary of Energy covering the acceptance of title, transportation, and long-term storage and disposal of SNF from SONGS Units 1, 2 and 3. Until the federal government approves a repository, SNF at SONGS will continue to be stored within the licensed area of the former nuclear power plant.

The U.S. Department of Transportation (DOT) and NRC are responsible for regulating the transport of radioactive materials. The DOT regulates shippers of radioactive materials, including vehicle safety, routing (including highway routing restrictions for certain waste shipments), documentation, emergency response, and training, while NRC regulations contain performance requirements for certain types of transportation packages of radioactive material, and the design, fabrication, use, and maintenance of shipping containers for HLW is under the NRC's jurisdiction. (See 49 CFR Parts 171-177 and 10 CFR Part 71.)

Under the Safe Drinking Water Act, the U.S. Environmental Protection Agency (USEPA) sets federal limits for drinking water contaminan2ts (maximum contaminant levels). These standards may be used to assess laboratory test results of groundwater from private wells. However, the groundwater beneath SONGS is not a source of drinking water. Reviews of the hydrogeologic characteristics of the area by a geotechnical consultant to the City of San Clemente and by SCE geologists concluded that any inadvertent contamination of groundwater beneath SONGS would not affect upgradient sources of drinking water (SCE 2016a – DR#1-97.C).

1.2.2 State

1.2.2.1 California State Lands Commission

The 21 acres of tide and submerged lands in the Pacific Ocean, southwest of the Onshore Site (Offshore Site), includes the majority of the CSLC Lease Facilities area. The CSLC has jurisdiction over the Offshore Site, which lies southwest of the Onshore Site on 21 acres of sovereign land in the Pacific Ocean covered by Lease PRC 6785.1. Table 1-2

[5] The NWPA specifies that the Secretary of Energy "shall take title to the high-level radioactive waste or spent nuclear fuel involved as expeditiously as practicable, upon the request of the generator or owner" (DOE 2004). Implementation of this provision of the NWPA is dependent on the certification of an SNF and other HLW repository site (see Appendix D for information on the status of federal SNF/HLW repositories.)

provides a brief timeline of this and prior CSLC leases for SONGS facilities. Relative to Lease PRC 6785.1, the Applicant proposes to:

- Partially remove and abandon in place the offshore Unit 2 and Unit 3 conduits and remove five offshore buoys: two navigational buoys that mark the Primary Offshore Intake Structures (POISs) and three environmental monitoring buoys used to collect data for a SONGS-related marine environmental monitoring program
- Seek a new lease to replace CSLC Lease PRC 6785.1, which expires in 2023, to allow for the disposition of the CSLC Lease Facilities as part of the decommissioning process to cover the anticipated decommissioning period (2019 to 2035), and authorize continued use of the riprap

Table 1-2. State Leases in Context of SONGS Actions

1960-1969	• In March 1964, the U.S. Atomic Energy Commission issued Permit No CPPR-13 for SONGS construction. The California Public Utilities Commission subsequently issued a Certificate of Public Convenience and Necessity for SONGS Unit 1. • In April 1964, the CSLC authorized two 3-year permits to SCE and SDG&E: PRC 3129.9 for use of 16.67 acres of sovereign land as a disposal area for upland sands removed during Unit 1 construction site preparation; and PRC 3130.1 for a temporary 3.45-acre offshore work area.[1] • In September 1964, the CSLC authorized Lease PRC 3193.1, for 15 years, with a provision for three 10-year renewal options, to SCE and SDG&E to construct, operate and maintain two water-circulating conduits and appurtenances on sovereign land next to the upland SONGS site.[2] • In 1967, SONGS Unit 1 began operations.
1970-1979	• In 1971, the CSLC approved EIR No. 2 and authorized Lease PRC 4560.1 to SCE and SDG&E to use three parcels of sovereign land as a disposal area for upland sands removed as a part of Units 2 & 3 construction site preparation: Parcels A (6.008 acres; 5 years); B (11.712 acres; 3 years); and C (3.363 acres; 3 years).[3] • In February 1974, the CSLC adopted EIR No. 141 and authorized Lease PRC 4862.1 to SCE and SDG&E for four 18-foot diameter concrete conduits and appurtenances on sovereign land (49 years) and a construction area (7 years).[4] • In November 1974, the CSLC authorized Lease PRC 4648.1 to SCE and SDG&E for 5 years, with four 5-year renewal options, to maintain 12 floating buoys, anchor blocks (sinkers), and oceanographic monitoring equipment on 0.087 acre of sovereign land offshore SONGS.[5]
1980-1989	• In February and November 1982, NRC granted operating licenses for Units 2 and 3. Units 2 and 3 began operations in August 1983 and April 1984, respectively. • In 1985, the CSLC combined Lease Nos. PRC 4560.1, PRC 4648.1, and PRC 4862.1, into General Lease – Industrial Use (PRC 6785.1) to SCE and SDG&E and the cities of Anaheim and Riverside (which had acquired interests in SONGS), effective March 1, 1981, for the Units 2 and 3 lease facilities. The term for the Units 2 and 3 cooling water conduits, walkway, and riprap (Parcel 1) was 42 years (expiring February 28, 2023); the monitoring equipment term (Parcel 2) was 19 years.[6]

Table 1-2. State Leases in Context of SONGS Actions

1990-1999	• In 1992, SONGS Unit 1 permanently shut down and Unit 1 decommissioning began.
2000-2009	• In February 2001, the CSLC authorized the amendment of Lease PRC 6785.1 to change the expiration date of the environmental and navigational monitoring buoys to coincide with the expiration of the other CSLC Lease Facilities.[7] • In 2005, the CSLC certified EIR No. 729 and authorized an amendment to Lease PRC 3193.1 for partial removal and abandonment of the Unit 1 intake and discharge structures in place and the removal of the vertical terminal structures, manhole risers, and surface marker buoy as part of the decommissioning process.[8] • In 2006 the CSLC authorized an assignment of interest in Lease PRC 6785.1 from the City of Anaheim (reducing its ~~ownership~~ lease interest ~~in SONGS~~ to zero) to SCE.[9]
2010-date	• In January 2012, Units 2 and 3 temporarily (later permanently) ceased operations. • In October 2012, the CSLC authorized an amendment of Lease PRC 6785.1 for the Applicant to install, use, and maintain ~~two~~ four Large Organism Exclusion Devices (one around each primary offshore intake structure and each auxiliary offshore intake structure at Units 2 and 3) in compliance with the State Water Resources Control Board Once-through Cooling Policy.[10] • In June 2013, SCE submitted a Certification of Permanent Cessation of Power Operations to NRC certifying the Plan to permanently shut down Units 2 and 3. • In October 2015, the CSLC amended Lease PRC 3193.1 for the continued maintenance of the two SONGS Unit 1 intake and discharge pipelines for a 3-year term beginning September 24, 2015.[11]

Acronyms: CSLC = California State Lands Commission; EIR = Environmental Impact Report; NRC = U.S. Nuclear Regulatory Commission; SCE = Southern California Edison; SDG&E = San Diego Gas and Electric; SNF = Spent Nuclear Fuel; SONGS = San Onofre Nuclear Generating Station

Notes (CSLC meeting staff reports):

[1] Item 13, April 29, 1964
[2] Item 10, September 24, 1964
[3] Item 12, March 1, 1971
[4] Item 6, February 6, 1974
[5] Item 11, November 21, 1974
[6] Item 27, January 31, 1985
[7] Item C56, February 5, 2001
[8] Item 31, October 20, 2005
[9] Item C38, November 21, 2006
[10] Item 78, October 19, 2012
[11] Item C55, October 16, 2015

The new lease, if approved, will provide the CSLC with discretion over lease termination requirements including, potentially, full removal of facilities and restoration of the lease premises. Therefore, although not part of the Proposed Project, the CSLC may, in the future, require SCE to remove all structures above the surface of the seafloor, such as all 126 discharge conduit diffuser ports prior to lease termination.

1.2.2.2 California Coastal Commission

The CCC will require a CDP for SONGS decommissioning operations in the coastal zone pursuant to the California Coastal Act (Pub. Resources Code, § 30000 et seq.) and may conduct a consistency review under the federal Coastal Zone Management Act for NRC actions or future DoN actions related to the SONGS Decommissioning Plan. The CCC

has a long permitting history related to SONGS decommissioning and onshore storage of SNF in the Approved ISFSI (see also Section 1.5.1, *Baseline and Future Conditions*).

- In 2000, the CCC approved CDP No. E-00-001 for the demolition and removal of SONGS Unit 1 onshore structures and construction of a temporary Approved ISFSI onshore (19 fuel storage modules [AREVA facility]) to store SNF from Unit 1.[6]
- In 2001, the CCC approved CDP No. E-00-014 for an expansion to the ~~original ISFSI~~ AREVA facility (additional 104 fuel storage modules) to store SONGS Units 2 and 3 SNF.[7]
- In 2014, the CCC approved CDP No. E-13-004 for the removal of vertical structures from, and permanent abandonment of, the offshore cooling water conduits that served the decommissioned SONGS Unit 1 power plant.[8]
- In 2015, the CCC approved CDP waiver No. 9-15-0417-W for the replacement of the large SONGS seawater intake pumps with smaller dilution pumps and CDP No. 9-15-0162 for a Spent Fuel Pool Island to replace once-through cooling of the Units 2 and 3 spent fuel pools.[9] After Units 2 and 3 were retired, all SNF was removed from the nuclear reactors and placed in the spent fuel pools, and the Unit 1 conduits were partially removed. SCE will complete transfer of SNF from the pools to dry-cask storage by the end of 2019.
- In 2015, the CCC also approved CDP No. 9-15-0228 to ~~further expand~~ construct the Holtec facility portion of the Approved ISFSI to accommodate all remaining SNF at SONGS. Construction of the ~~ISFSI expansion~~ Holtec facility was completed on January 19, 2018.[10] If SNF has not been transferred off site by 2035, as a condition of CDP No. 9-15-0228, the CCC will evaluate the Approved ISFSI location in 2035 based on an analysis of future coastal hazards.

1.2.2.3 Settlement Agreement

The CCC CDP No. 9-15-0228 was challenged in court in November 2015 and resolved by settlement in August 2017 (*Citizens Oversight, Inc., et al. v. California Coastal Commission, Southern California Edison Company, et al.* [*Citizens Oversight*], Superior Court for County of San Diego Case No. 37-2015-00037137-CU-WM-CTL). (See also Section 1.5.2*, Uncertainty Regarding Future Decommissioning Plan Activities*.) Settlement Agreement stipulations and SCE commitments include those listed below.

- SCE shall retain an "Experts Team" to advise SCE on issues related to the proposed relocation of SONGS Spent Fuel to an Offsite Storage Facility.

[6] Described on page 6 of https://documents.coastal.ca.gov/reports/2001/6/W15a-6-2001.pdf.==
[7] See: https://documents.coastal.ca.gov/reports/2001/6/W15a-6-2001.pdf.
[8] See: https://documents.coastal.ca.gov/reports/2014/7/Th12a-7-2014.pdf.
[9] See: https://documents.coastal.ca.gov/reports/2015/5/th8-5-2015.pdf, and https://documents.coastal.ca.gov/reports/2015/8/th15a-8-2015.pdf
[10] See: https://documents.coastal.ca.gov/reports/2015/10/Tu14a-10-2015.pdf.

- SCE shall develop: (1) a conceptual "Transportation Plan" to transport SONGS Spent Fuel to an Offsite Storage Facility assumed to be located in the southwestern U.S.; and (2) a "Strategic Plan" to support the development of a Commercially Reasonable Offsite Storage Facility (together, the Plans).
- SCE will make a written request to solicit an agreement from the owners of Palo Verde Generating Station, a nuclear power plant near Tonopah, Arizona, regarding the development of an expanded ISFSI at the Palo Verde site to store SONGS Spent Fuel ~~at the Palo Verde site~~. If such request is accepted, SCE will engage in discussions with the owners of Palo Verde to evaluate the feasibility of licensing, constructing, and operating such an expanded facility on Commercially Reasonable terms.
- SCE shall develop the Approved ISFSI Inspection and Maintenance Program required as Special Condition 7 under the 2015 CDP by October 6, 2020 (2 years earlier than required by the CCC), and a written plan that addresses contingencies for damaged or cracked canisters consistent with NRC regulations and requirements.

1.2.2.4 California Department of Toxic Substances Control

The California Department of Toxic Substances Control (DTSC) regulates the hazardous component of mixed waste or combined waste (waste containing both hazardous and low-level radioactive materials). The radioactive component is regulated by the NRC (CalEPA and DTSC 2016). The DTSC has a long permitting history related to SONGS, as detailed below:

- In 1989, the DTSC first authorized SONGS to operate a hazardous waste storage facility under a grant of interim status
- In 1992, the Unit 1 reactor was retired; D&D activities started in 1999; and the DTSC completed a Resource Conservation and Recovery Act (RCRA) Facility Assessment in 2002 (DTSC 2002)
- In 2004, the DTSC issued a Consent Order, Docket HWCA 20020097, Health and Safety Code Section 25187 (DTSC 2004) constituting full settlement against the Facility (SONGS) for violations against Health and Safety Code, Section 25202, subdivision (a), and California Code of Regulations, Title 22, sections 66265.143, 66265143(e)(5), and 66265.143(e)(7), in that and in addition to others, "Respondent" [SONGS] failed to establish and demonstrate current and valid financial assurance for closure and alternate financial assurance
- In 2005, the DTSC issued the first Hazardous Waste Facility Permit for SONGS, effective January 31, 2005 to January 30, 2015
- In 2014, the DTSC received a Hazardous Waste Facility Permit renewal application for SONGS requesting authorization to continue to store hazardous

waste at the Facility (SONGS) while performing decommissioning activities. The DTSC reviewed the application and determined it to be technically complete on October 30, 2015. The permit renewal was approved and went into effect May 23, 2016 and is effective through May 23, 2026.

1.3 PROPOSED PROJECT OBJECTIVES

Based on the Applicant's stated objectives for the Proposed Project and CSLC staff's review, and consistent with implementing the SONGS Decommissioning Plan in a safe, timely, and cost-efficient manner, the Proposed ~~p~~Project objectives include:

- Reduce radioactivity on the SONGS site in accordance with NRC regulations for unrestricted use
- Dismantle and remove the offshore facilities in a manner that is least impactful to the environment to minimize navigational hazards and satisfy CSLC requirements
- Commence the Proposed Project to promptly complete radiological decontamination of the SONGS site
- Implement the Proposed Project in a manner that maximizes efficiencies and retains flexibility to respond to future conditions
- Complete the Proposed Project in a manner that ensures prudent use of ratepayer funds set aside for the SONGS Decommissioning Plan.

1.4 OVERVIEW OF THE ENVIRONMENTAL REVIEW PROCESS

1.4.1 Project Context with Respect to CEQA

The actions proposed by the Applicant are subject to CEQA. Pursuant to State CEQA Guidelines section 15378, the CSLC must review "the whole of [the] action that has a potential for resulting in either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment." For the Proposed Project, this includes onshore and offshore areas, not just the portion on CSLC lands. With limited exceptions, CEQA requires the CSLC, before approving a project over which it has discretionary authority, to consider the environmental consequences of the project. CEQA establishes procedural and substantive requirements that agencies must satisfy to meet CEQA's objectives, which are (State CEQA Guidelines, §§ 15002 and 15083):

- Ensure that the significant environmental effects of proposed activities are disclosed to decision makers and the public
- Identify ways to avoid or reduce environmental damage
- Prevent environmental damage by requiring implementation of feasible alternatives and/or mitigation measures

- Make public the reasons for agency approval of projects with significant environmental effects
- Foster multi-disciplinary interagency coordination in the review of projects
- Enhance public participation in the planning process

Other key requirements include carrying out specific noticing and distribution actions to maximize public involvement in the environmental review process. CEQA section 21002 also states in part that it is the State's policy that public agencies:

> *… should not approve projects as proposed if there are feasible alternatives or feasible mitigation measures available which would substantially lessen the significant environmental effects of such projects, and that the procedures required by this division are intended to assist public agencies in systematically identifying both the significant effects of proposed projects and the feasible alternatives or feasible mitigation measures which will avoid or substantially lessen such significant effects.*

The CSLC staff determined that the Proposed Project could result in significant environmental impacts and that an EIR is required to analyze the Proposed Project and feasible alternatives. The purpose of an EIR is not to recommend either approval or denial of a project. The EIR is an informational document that assesses potential environmental effects of a project and identifies mitigation measures and project alternatives that could reduce or avoid significant environmental impacts (State CEQA Guidelines, § 15121). Consistent with CEQA requirements, the CSLC has engaged in a good faith, reasonable effort towards full public disclosure of the potential effects of the Proposed Project. Prior to any decision on whether to approve ~~the Proposed Project under~~ a new lease <u>for the CSLC Lease Facilities</u>, the CSLC must certify that (State CEQA Guidelines, § 15090):

- The Final EIR has been completed in compliance with CEQA;
- The Final EIR was presented to the CSLC in a public hearing and the CSLC reviewed and considered the information contained in the Final EIR prior to taking action ~~on the Project~~;
- The Final EIR reflects the CSLC's independent judgment and analysis.

The CSLC must also adopt a plan to implement and monitor any identified mitigation measures (see Section 7.0, *Mitigation Monitoring Program*). State CEQA Guidelines section 15121, subdivision (b) further requires public agencies, before Project approval, to prepare written findings of fact for each significant environmental impact identified in an EIR. Possible findings are (State CEQA Guidelines, § 15091):

- The project has been changed (including adoption of mitigation measures) to avoid or substantially reduce the significant environmental effect

- Changes to the project that would lessen the significant environmental effect are within another agency's jurisdiction and have been or should be required by that agency
- Specific economic, legal, social, technological, or other considerations make the mitigation measures or alternatives identified in the EIR infeasible

Under CEQA, if the CSLC finds that the above considerations make identified mitigation measures or alternatives infeasible and that implementation of the Proposed Project would cause one or more significant effects to occur, the CSLC can only approve the ~~Proposed Project under a~~ new lease if it prepares a written statement that the lease and Proposed Project's benefits (including economic, legal, social, technological, or other region- or statewide benefits) outweigh the unavoidable adverse environmental effects. This "statement of overriding considerations" must state specific reasons for the decision supported by substantial evidence in the record (State CEQA Guidelines, § 15093).

1.4.2 Project Context with Respect to National Environmental Policy Act

The CSLC is preparing a CEQA document for the Proposed Project, not a joint NEPA/CEQA document with the NRC or DoN. As discussed in Section 1.2, *Legal and Governmental Authority*, the NRC prepared a Final GEIS Supplement (NUREG-0586) in 2002 that analyzed environmental impacts associated with the decommissioning of nuclear power plants throughout the country, while additional NEPA review by the DoN would occur ~~in the future at the time of federal lease termination~~at the time of DoN easement-related actions.

1.4.3 Public Scoping (2016)

On July 12, 2016, pursuant to Public Resources Code section 21080.4 and State CEQA Guidelines section 15082, subdivision (a), the CSLC issued the Notice of Preparation (NOP) of a Draft EIR for the Proposed Project to responsible and trustee agencies and other interested parties. Through the NOP, the CSLC solicited written and verbal comments on the EIR's scope during a 30-day comment period and provided information on forthcoming public scoping meetings that were held in Oceanside and San Clemente on July 26, 2016, and July 27, 2016, to solicit verbal comments on the scope of the EIR. Meeting transcripts are provided in Appendix C. Table 1-3 lists the NOP commenters.

Table 1-3. NOP Commenters

Applicant	• Southern California Edison
State Agency	• California Coastal Commission • California Department of Fish and Wildlife • California Department of Toxic Substances Control • California Department of Transportation (Caltrans) District 11 • Native American Heritage Commission

Table 1-3. NOP Commenters

Local/Regional Agency/Entity	• City of Laguna Beach • City of San Diego Public Library • County of Los Angeles Fire Department • County of Riverside Transportation and Land Management Agency • County of San Diego Planning & Development Services • North County Transit District	
Tribal Member	• Pala Tribal Historic Preservation Office	
Non-Governmental Organization	• Alliance for Nuclear Responsibility • Amtrak Environment and Sustainability • Orange County Coastkeeper	• Public Watchdogs • SanOnofreSafety.org • Sierra Club Los Angeles Chapter • The Nicolas Endowment
Individuals	• Jerry and Carol Collamer • Marilyn Fuss • Daryl Gale • Hallie Glaze • W. Geoff Harris • Dr. Rose O. Hayes	• Ace Hoffman • Ronald D. Kennedy • Marni Magda • Barbara Metzger • Rita Pescador
Scoping Meeting Comments	• Peter Stoup, Post Ignorance Project • Rick Wilson, Surfrider Foundation • Ray Lutz, Citizens' Oversight • Nina Babiarz, Women's Transportation Seminar • Charles Langley, Public Watchdogs • Ace Hoffman • Greg Alexander	• Daniel Beeman • Abel Alcaraz • Donna Gilmore • Marni Magda, Sierra Club • Geoff Harris • Cybil Street • Barbara Metzger • Verna Rollinger

1.4.4 Availability of the EIR

Placing CEQA documents at readily accessible sites such as local libraries can be an effective way to provide the public with information about a project. This EIR is available for reviewing at three sites in the Proposed Project vicinity and at CSLC offices in Long Beach and Sacramento (see Table 1-4).

Table 1-4. Locations to Review the EIR

Libraries:		
Oceanside Public Library 330 N. Coast Highway Oceanside, CA 92054 [Phone: (760) 435-5600]	San Clemente Library 242 Avenida del Mar San Clemente, CA 92672 [Phone: (949) 492-3493]	Fallbrook Branch Library 124 S. Mission Road Fallbrook, CA 92028 [Phone: (760) 731-4650]
CSLC Offices (see also CSLC website at www.slc.ca.gov/Info/CEQA.html):		
California State Lands Commission 200 Oceangate, 12th Floor Long Beach, CA 90802 Attn: Mark LeClair [Phone: (562) 590-5266]		California State Lands Commission 100 Howe Ave., Suite 100-South Sacramento, CA 95825 Attn: Cynthia Herzog [Phone: (916) 574-1310]

1.5 PURPOSE AND SCOPE OF EIR

The purpose of this EIR is to identify the significant effects on the environment of the Proposed Project, ~~to identify~~ and feasible mitigation measures or alternatives ~~to the Proposed Project, and to indicate the manner in which those significant effects~~ that can ~~be mitigated~~ significantly lessen or avoid~~ed~~ such impacts (Pub. Resources Code, § 21002.1, subd. (a)). This EIR is intended to provide the CSLC with information required to exercise its jurisdictional responsibilities with respect to the ~~approval~~ lease, which is a component of the ~~Proposed Project under a~~ new lease (to be considered at a noticed public hearing). Responsible agencies may use the information in the certified EIR to exercise their jurisdictional or regulatory responsibilities related to the Proposed Project.

An EIR is required to describe physical environmental conditions in the vicinity of the project in order to provide a baseline for comparison to determine potential project impacts and gauge their significance (State CEQA Guidelines, § 15125). Use of an appropriate baseline is also important for establishing alternatives to the proposed activities that can be analyzed in an EIR. The alternatives must be capable of reducing or avoiding one or more significant impacts of a project, but do not need to address impacts associated with existing conditions. The CSLC must identify which parts of the Proposed Project are known or reasonably foreseeable; if it finds that a particular impact is too speculative for evaluation, the CSLC should note its conclusion and terminate discussion of the impact (State CEQA Guidelines, § 15145).

1.5.1 Baseline and Future Conditions

Baseline conditions are defined as the existing physical environmental setting by which a lead agency determines whether an impact is significant (State CEQA Guidelines, § 15125, subd. (a)). A significant environmental effect or impact is defined as a substantial or potentially substantial adverse change in the environment" (Pub. Resources Code, §§ 21068, 21100, subd. (d); State CEQA Guidelines, § 15358).

Potential impacts are often analyzed in the context of the local and regional physical environmental conditions existing at the time a NOP for a project EIR is released (in this case, July 2016). Future conditions may be included in or used for the baseline environmental setting in some circumstances, such as conditions that will exist when a project begins operations (a "date-of-implementation" baseline). (*Neighbors for Smart Rail v. Exposition Metro Line Constr. Auth*., 57 Cal.4th 439, 452-454 (2013).) For the Proposed Project, the existing physical setting includes actions completed or initiated by the Participants related to onsite SNF storage onshore pursuant to CSLC and CCC approvals (see Table 1-2 above), including CCC actions related to the Approved ISFSI. Because the expanded Approved ISFSI has already been approved, constructed, and is in operation, and will continue to operate whether or not the Proposed Project is approved, and because the Proposed Project would not change the amount or method of SNF storage on site, the presence and operation of the Approved ISFSI is considered part of

baseline conditions to provide an accurate and realistic basis for evaluating potential Proposed Project impacts. Baseline conditions also include ongoing maintenance and hazard elimination as well as the following planning and preparatory activities related to SONGS Units 2 and 3 that the Participants have already completed or initiated: Cold and Dark (C&D) Modifications; Transition Activities; Cleanup of Unused Materials and Equipment; Portal Monitors and Scales; and Site Characterization (information on these activities is provided in Section 2.2.2, *Existing Project Setting (Approved and Completed Activities*).

1.5.2 Uncertainty Regarding Future Decommissioning Plan Activities

The Applicant's proposed scope of work (Proposed Project) evaluated in this EIR consists of: (1) decontamination, dismantlement, and removal as necessary of above-grade structures onshore to meet NRC decommissioning requirements for unrestricted use; and (2) disposition of the SONGS Unit 2 and Unit 3 offshore conduits pursuant to CSLC lease requirements. Future SONGS Decommissioning Plan activities are currently unknown and are too speculative to be analyzed for environmental impacts in this EIR. However, to maximize disclosure to the decisionmakers and the public, this EIR provides information on the Future Activities to the extent such information is available. The uncertainty related to these Future Activities results from the following:

- SNF will ultimately be transferred to an off-site storage facility; however, no such facility currently exists or will exist until the DOE fulfills its Standard Contract obligation to permanently dispose of the SONGS SNF. Implementation of the August 25, 2017, *Citizens Oversight* Settlement Agreement (see Section 1.2.2.3, *Settlement Agreement*) could result in the transfer of the SNF to a federal or privately-owned consolidated interim storage facility before a permanent federal repository is established. However, the location of a site or repository and timeline for off-site relocation of SNF are unknown and speculative. As a condition of CDP No. 9-15-0228, the CCC will evaluate the Approved ISFSI location in 2035 (it the SNF has not been already been transferred) based on an analysis of future coastal hazards to determine if the Approved ISFSI must be relocated or retained at its current site for a specified time. The uncertain duration of the Approved ISFSI's presence at SONGS impedes the Participants' ability to define the SONGS Decommissioning Plan beyond the Proposed Project. (See Appendix D1 and D3 for more information regarding the management and disposal of SNF and high-level radioactive waste associated with SONGS, including on-site storage and off-site transportation and disposal.)
- Implementation of Future Activities is dependent on the disposition of the SNF. For example, portions of the Unit 1 substructure remain below the Approved ISFSI and cannot be removed until the SNF is transferred to an off-site storage facility. Future Activities could include additional substructure removal; transport of the SNF; and disposition of the Approved ISFSI, the seawall (on DoN land), the riprap (on both

DoN and CSLC land), and remaining diffuser ports yet to be removed from the discharge conduits. As the landowner where these structures are located, the DoN is expected to determine the disposition of the seawall and onshore SONGS facilities, including the extent of onshore substructure removal. Although the seawall is not needed to protect the Approved ISFSI from natural events, it is relied upon to function as a security barrier (SCE 2015d). The DoN is expected to make these decisions, supported by a NEPA review, at a future date when more information about the timing for SNF off-site relocation is known.

- Landowner and agency decisions regarding Future Activities such as the amount of substructure removal and end state will also be informed in part by updated assessments of coastal processes at the SONGS site and regulatory guidance. As part of its SONGS Decommissioning Plan, SCE performed a Coastal Processes Study to guide its end-state proposal to the DoN. Based on currently available information, this Study indicates that onshore subsurface structures (landward of the seawall) that remain after Proposed Project completion would be exposed in the long-term after the seawall is removed. Agency projections regarding sea-level rise are evolving and new scientific observations and modeling will update predictions of future coastal conditions at SONGS as a function of sea-level rise and other coastal processes.

By 2035, new information will likely clarify these current uncertainties. This EIR discloses information concerning anticipated Future Activities to the extent the information is known.

1.5.3 Potential Impacts and Summary of Alternatives Evaluated

This EIR identifies potential impacts of the Proposed Project on the environment and indicates if and how impacts can be avoided or reduced by Applicant-proposed measures (APMs, see Table 4.1), mitigation measures, or alternatives. As described in Section 4.0, *Environmental Impact Analysis*, the following resource areas would not be impacted by the Project: Agriculture and Forestry Resources, Mineral Resources, and Population and Housing.

The Proposed Project could have a significant impact on the following resource areas:

- Hazardous and Radiological Materials
- Aesthetics
- Air Quality
- Biological Resources (Marine/Terrestrial)
- Cultural and Paleontological Resources
- Cultural Resources – Tribal
- Geology, Soils, and Coastal Processes
- Greenhouse Gas Emissions
- Hydrology and Water Quality
- Land Use and Planning
- Noise
- Recreation and Public Access
- Transportation and Traffic
- Utilities and Public Service Systems

This EIR is prepared consistent with the California Supreme Court decision in *California Building Industry Association v. Bay Area Air Quality Management District* ((2015) 62 Cal. 4th 369, 386), in which the Court held that "CEQA generally does not require an analysis of how existing environmental conditions will impact a project's future users or residents." With limited exceptions, the Court concluded that the impacts of existing environmental hazards only need to be analyzed if a proposed project risks exacerbating those hazards or conditions. Therefore, this EIR does not identify hazards presented by earthquakes, tsunamis, or other existing hazardous conditions as impacts of the Proposed Project, but rather describes these hazards as part of the environmental setting.

Pursuant to State CEQA Guidelines section 15126.6, an EIR must describe and evaluate a range of reasonable alternatives that would feasibly attain most of a project's basic objectives and would avoid or substantially lessen any of the significant impacts of a project as proposed. The State CEQA Guidelines also state that the range of alternatives required to be evaluated in an EIR is governed by the "rule of reason" (§ 15126.6, subd. (f))—that is, an EIR needs to describe and evaluate only those alternatives necessary to permit a reasoned choice and to foster informed decision making and public participation. Table 1-5 identifies the potential alternatives considered but not carried forward for detailed analysis in this EIR and those identified alternatives to the Proposed Project that are analyzed in greater detail (see Section 5.0, *Project Alternatives Analysis*).

Table 1-5. Potential Alternatives to the Proposed Project

Alternatives Eliminated from Consideration	Alternatives Evaluated in EIR
• Crush Conduits in Place • Local Relocation of the Approved ISFSI in 2035 • Containment Buildings for Interim Storage Facilities for SNF • Laser Reduction of the Isotopes in SNF • Retention of Spent Fuel Pools • Full Removal of Shoreline Structures • Final End-State Restoration Options • Future Uses for the SONGS Site • Accelerated Removal of SNF from SONGS • Alternate Sites for Disposal of SNF and Other HLW • In-State Disposal of Non-Radioactive Waste and Recycling	• No Project Alternative • Full Removal of Offshore Conduits • Partial Removal of Offshore Conduits • Full (or Partial) Removal of Onshore Subsurface Structures

1.5.4 Cumulative Impact Analysis

An EIR must discuss the cumulative impacts of a project when the project's incremental effect is "cumulatively considerable" (State CEQA Guidelines, § 15130). A cumulative impact is an impact that is created through a combination of a project being analyzed in the EIR and other projects in the area causing related impacts. Section 3.0, *Cumulative Projects*, defines the applicable geographic scope of the cumulative analysis ("Cumulative

Projects Study Area") and lists future planned and approved projects to be included in the cumulative environment.

1.6 AGENCY USE OF EIR / ANTICIPATED APPROVALS

An EIR shall identify the ways in which the lead and responsible agencies would use the document in their approval or permitting processes (State CEQA Guidelines, § 15124, subd. (d)). The CSLC, as the lead agency preparing this EIR, is responsible for considering the effects, both individual and collective, of all activities involved in the Proposed Project, to the extent ascertainable; each responsible agency is responsible for considering the effects of those activities that it is required by law to carry out or approve (Pub. Resources Code, § 21002.1, subd. (d)). The information provided in this EIR, if certified, will assist the CSLC in any decision to approve or deny the ~~Proposed Project~~lease. The DoN may also use information in the EIR as part of its future actions related to the onshore SONGS site, including review of these actions in accordance with NEPA. In addition to the CSLC, DoN/MCBCP, NRC, DOE, and DOT, Table 1-6 lists other agency approvals that may be required for the SONGS Decommissioning Plan.

Table 1-6. Other Anticipated SONGS Decommissioning Plan Approvals

Agency	Permit, Approval, or Consultation	Covered Activity
Local/Regional		
North County Transit District (NCTD)	Railway License; Right of Entry Permits	Modification of existing rail spur/track. Any activity on or adjacent to NCTD right-of-way
San Diego Air Pollution Control District (SCAPCD)	Permit to Operate (PTO), Portable Equipment Registration, Asbestos and Lead Paint Removal Notifications	A PTO is required for stationary equipment that triggers SDAPCD permitting and portable equipment (e.g., generators, pumps, concrete crusher) with engines 50 horsepower or larger in use for more than 12 months. If less than 12 months, a Portable Equipment Registration can be obtained from SDAPCD or CARB or must have a PTO. Notifications must be submitted to SDAPCD for asbestos and lead paint removal operations.
San Diego County Department of Environmental Health	Permit (the Department also acts as the Certified Unified Program Agency)	Hazardous waste handling, storage, generation, and treatment, under-ground storage tanks, groundwater monitoring wells, borings.
San Diego County Planning and Development Services	Construction permits	Work (to accommodate Proposed ~~p~~Project-~~-~~related truck trips) in the County right-of-way.

Table 1-6. Other Anticipated SONGS Decommissioning Plan Approvals

Agency	Permit, Approval, or Consultation	Covered Activity
State		
California Air Resources Board (CARB)	Portable Equipment Registration Program	Portable equipment (e.g., generators, pumps, concrete crusher) with engines 50 horsepower or larger in use for less than 12 months.
California Coastal Commission	Coastal Development Permit	All decommissioning activities.
California Department of Transportation (Caltrans)	Transportation and Encroachment Permits	Vehicle operation/movement. Modification/installation of a structure in State highway rights-of-way.
California Highway Patrol	Transportation License	Transport of hazardous materials on California highways.
Department of Fish and Wildlife	Incidental Take Permit	Potential for take of State-listed threatened or endangered species.
Department of Parks and Recreation	Consultation with State Historic Preservation Officer	Construction activities and potential use of Park lands, beach access, and protection of State historic properties.
Department of Toxic Substances Control	Hazardous Waste Facility Permit (currently SONGS RCRA-equivalent hazardous waste facility permit [USEPA ID CAD000630921])	Generation and storage of hazardous, mixed, and combined waste. Investigation, cleanup/remediation (if necessary), and closure of the permitted treatment, storage, and disposal facility, any areas of concern, and solid waste management units.
San Diego Regional Water Quality Control Board	Clean Water Act (CWA) Section 401 Water Quality Certification, Dredging Plan	Approval and oversight of potential impacts of ~~conduit dispositioning~~ CSLC Lease Offshore Activities on water quality.
Federal		
National Marine Fisheries Service and U.S. Fish and Wildlife Service	Protection of federally listed marine resources, implementation of Marine Mammal Protection Act and Magnuson-Stevens Fishery Conservation and Management Act, Conservation, protection, and enhancement of fish, wildlife, plants, and their habitats.	
U.S. Army Corps of Engineers	CWA Section 404 permit; Section 10 consultation; Dredging Plan	Development, maintenance and protection of waters of the U.S. and associated resources.
U.S. Coast Guard	Notice to Mariners	Offshore conduit work.

1.7 ORGANIZATION OF EIR

The EIR is presented in nine sections.

- **Section 1.0 – Introduction** provides background on the Proposed Project and the CEQA process.
- **Section 2.0 – Project Description** describes the CSLC lease area, Proposed Project elements and activities, and the decommissioning process and schedule.
- **Section 3.0 – Cumulative Projects** identifies the projects that are analyzed for potential cumulative effects and the EIR's approach to cumulative impact analysis.
- **Section 4.0 – Environmental Impact** Analysis describes existing environmental conditions, Proposed Project-specific impacts, mitigation measures, and residual effects for multiple environmental issue areas, and evaluates cumulative impacts.
- **Section 5.0 – Project Alternatives Analysis** describes the alternatives screening methodology, alternatives rejected from full consideration, and alternatives carried forward for analysis, and analyzes impacts of each alternative carried forward.
- **Section 6.0 – Other Required CEQA Sections and Environmentally Superior Alternative** addresses other required CEQA elements, including significant and irreversible environmental and growth-inducing impacts, comparison of the Proposed Project and alternatives, and identification of the environmentally superior alternative.
- **Section 7.0 – Mitigation Monitoring Program** describes the monitoring authority, enforcement and mitigation compliance responsibilities, and general monitoring procedures, and presents the mitigation monitoring table.
- **Section 8.0 – Other Commission Considerations** presents information relevant to the CSLC's consideration of SCE's lease application for the Proposed Project, including climate change and sea-level rise considerations, commercial fishing (socioeconomics), environmental justice, and statutory responsibility pursuant to Public Resources Code section 6370 to provide for the permanent protection of lands within Commission jurisdiction that have been identified as possessing significant environmental values (see also Cal. Code Regs., tit. 2 § 2951 et seq.). Other considerations may also be addressed in the staff report presented at the time of the CSLC's consideration of the lease application.
- **Section 9.0 – Report Preparation Sources and References** lists the persons involved in preparation of the EIR and the reference materials used.

The ~~nine~~11 appendices are summarized below.

- **Appendix A** contains an abridged list of major federal and state laws, regulations, and policies potentially applicable to the Proposed Project organized by issue area.

- **Appendix B** contains the ~~Draft~~ EIR distribution list.
- **Appendix C** includes a copy of the NOP and comment letters received in response to the NOP.
- **Appendix D** contains several appendices related to radiological hazards and environmental review of nuclear power facilities.
    - **Appendix D1: Management, Storage, Transportation, and Disposal of Spent Nuclear Fuel and High-Level Waste at San Onofre Nuclear Generating Station** provides background information on management, storage, transportation, and disposal of SNF and HLW.
    - **Appendix D2: Radiological Scoping and Characterization Data**, presents results of a radiological scoping survey that provides information on existing onshore and offshore radiological conditions.
    - **Appendix D3: Spent Nuclear Fuel Transportation Experience and Risk Assessments** provides background information on transportation of SNF, HLW, and radioactive materials generally.
    - **Appendix D4: Nuclear Regulatory Commission Environmental Impact Evaluation** provides background information on federal environmental review of the decommissioning of nuclear facilities.
    - **Appendix D5: Radiation Basics** provides background information on basic radiation concepts and human health.
    - **Appendix D6: Post-Shutdown Decommissioning Activities Report** is the PSDAR prepared by the Participants for SONGS Units 2 and 3. For additional background on the PSDAR, see Section 1.2.1.2, *U.S. Nuclear Regulatory Commission*.

  Appendices D1, D3, D4, and D5 are not directly related to analysis of the Proposed Project and are background papers provided to inform the public given the highly technical and high-profile nature of nuclear power plant decommissioning. As discussed in Section 1.1, *Proposed Project Background and Location*, the federal government has exclusive jurisdiction over the radiological aspects of decommissioning. As discussed in Section 1.2.2.2, *California Coastal Commission*, the ~~expansion,~~ operation~~,~~ and maintenance of the Approved ISFSI and storage and transportation of SNF are also not part of the Proposed Project.
- **Appendix E** includes the spreadsheets used to calculate air pollutant emissions for the Proposed Project and the Full Removal of Offshore Conduits Alternative.
- **Appendix F** contains information on special-status species (Appendix F1), underwater photos taken along the offshore discharge conduits (Appendix F2), and the effects of sound on marine biological resources (Appendix F3).

- **Appendix G** is a confidential appendix of California Historical Resources Information Center record search results for cultural resources near SONGS.
- **Appendix H** contains noise modeling output for the Proposed Project.
- **Appendix I** contains the SONGS Decommissioning Traffic Study.
- **Appendix J** contains a list of commenters on the Draft EIR that submitted form letters.
- **Appendix K** contains the Participants comment letter Attachments B through K.

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2.0 PROJECT DESCRIPTION

2.1 PROJECT SUMMARY

Southern California Edison Company (SCE), San Diego Gas & Electric Company (SDG&E), and cities of Riverside and Anaheim (collectively, Participants) plan to decommission the San Onofre Nuclear Generating Station (SONGS) pursuant to U.S. Nuclear Regulatory Commission (NRC) and landowner—U.S. Department of the Navy (DoN) and California State Lands Commission (Commission or CSLC)—requirements. The CSLC's jurisdiction with respect to the SONGS Decommissioning Plan includes the Units 2 and 3 offshore intake and discharge conduits, riprap along the shore seaward of the ordinary high-water mark, and five offshore buoys authorized under CSLC Lease No. PRC 6785.1 (**CSLC Lease Facilities**). SCE, SDG&E, and the City of Riverside (collectively, Applicant)[11] applied to the CSLC for a new lease to replace Lease No. PRC 6785.1, which expires in 2023, to (1) achieve the CSLC's desired disposition of the CSLC Lease Facilities, and (2) cover any facilities that remain on the ~~L~~lease ~~P~~premises until 2035.

For the purposes of the CSLC's review as California Environmental Quality Act (CEQA) lead agency, Section 2.0 of this Environmental Impact Report (EIR) describes the "Proposed Project," including Decontamination and Dismantlement (D&D)[12] of structures, systems, and components (SSCs) from 2019 through 2028 (see Table 2-1).[13] The EIR does not analyze the following ~~activities proposed as part~~ related, but separate and independent components of the ~~larger~~ overall SONGS Decommissioning Plan (see Table 1-1 in Section 1.0, *Introduction*).

- **Approved Independent Spent Fuel Storage Installation (Approved ISFSI) ~~Expansion,~~ Operation~~,~~ and Maintenance** (2015-2035). The Approved ISFSI is an existing spent fuel storage facility that was constructed in two phases (AREVA and Holtec facility installations). ~~Expansion~~ The AREVA facility portion of the Approved ISFSI was approved by the California Coastal Commission (CCC) in 2000 and 2001, and the Holtec facility portion of the Approved ISFSI was approved by the CCC in 2015. Construction of the Holtec facility portion was completed on January 19, 2018, for the additional storage of spent nuclear fuel (SNF) on-site (see Section 2.2.2.1, *Approved Independent Spent Fuel Storage Installation ~~Expansion,~~ Operation~~,~~ and Maintenance*).
- **Future Activities** (estimated to start in 2035) are currently undefined and speculative but are generally disclosed in Section 2.4 based on best available

[11] The City of Anaheim is a co-owner of SONGS but is not a party to CSLC Lease PRC 6785.1.

[12] Decontamination includes removal of all radioactive or other hazardous materials that exceed NRC-established release criteria. Dismantlement involves physical removal.

[13] The Project Description is substantially derived from information provided in the Applicant's Lease Application (SCE 2016c) and Supplement and data responses provided by SCE.

information or reasonable assumptions of the activities required. These activities likely include: continued transport of SNF off-site; removal of onshore Unit 2 and 3 substructures and subsurface material if required by NRC or DoN; removal of remaining discharge conduit diffuser ports; disposition of shoreline seawall, public beach access walkway, and riprap; and final site restoration and conclusion of any activities needed for final NRC license termination and to meet landowner requirements.

Table 2-1. Proposed Project Activities (2019 – 2028)

- Reconfigure and/or reinforce site access roads and entrances, as needed for construction equipment access
- Install temporary trailers for personnel
- Install, modify, or upgrade rail infrastructure
- Perform site preparations and establish equipment and material staging yards
- Provide temporary utilities including water, electricity, and ventilation
- Construct temporary containment enclosures, as needed to perform Decontamination and Dismantlement activities
- Complete radiological remediation pursuant to applicable U.S. Nuclear Regulatory Commission regulations
- Remediate non-radiological hazards
- Segment reactor vessel internals and package for shipment and disposal
- Remove and dispose of large components (e.g., Units 2 and 3 reactor vessels, steam generators, pressurizers, turbine-generators, Unit 1 reactor vessel)
- Dismantle Containment Buildings
- Remove all remaining <u>onshore</u> above-grade structures
- Partially remove onshore subsurface structures, systems, and components (SSCs) in connection with decontamination work with some additional non-radiological removal below that level
- Remove retaining wall between North Industrial Area and Units 2 and 3 areas
- Remove security features no longer required by the Independent Spent Fuel Storage Installation-only Physical Security Plan
- Process wastewater
- Dispose of all solid waste in accordance with applicable regulations
- Seal or plug the intake and discharge conduits at the seawall<u>; Unit 2 discharge conduit would not be plugged/sealed until all Proposed Project dilution activities and wastewater discharges have ceased or been rerouted</u>
- Remove wastewater treatment plant and install replacement system (e.g., pumpout tank(s) or similar)
- Partially remove intake and discharge conduit risers
- Remove five navigational and environmental monitoring buoys and anchor~~s~~ blocks (sinkers)

In December 2016, the Participants selected, after a competitive bid, the joint venture between AECOM and EnergySolutions (collectively called SONGS Decommissioning Solutions), as the Decommissioning General Contractor (DGC).

2.2 PROJECT SETTING

2.2.1 Local and Regional Setting

The SONGS site is located on the northern San Diego coast primarily within Marine Corps Base Camp Pendleton (MCBCP), which spans more than 125,000 acres and is the U.S. Marine Corps' primary amphibious training base on the west coast (see Figures 1-1 and 1-2 in Section 1.0, *Introduction*). Amphibious and sea-to-shore training occurs along the base's 17 miles of coastline (Military 2016). Apart from the MCBCP, which has a military population of more than 36,000 (Lincoln Military Housing 2016), the nearest community is the city of San Clemente in Orange County, about 2 miles north-northwest of SONGS, which has a population greater than 66,000 (as of May 2014) and more than 26,000 housing units (City of San Clemente 2016c). The nearest city in San Diego County is Oceanside, about 15 miles south-southeast of SONGS, which has a population of nearly 176,000 and more than 66,000 housing units (City of Oceanside 2016a). SONGS was the second-to-last commercial nuclear power plant to operate in California.[14] The Encina Power Plant, located about 20 miles south of SONGS, is the closest operating commercial power plant to SONGS. A new natural gas power plant, the Carlsbad Energy Center, has been approved to replace the Encina Power Plant at an adjacent site.

This EIR identifies three sites within which Proposed Project activities would occur (see Figures 2-1 and 2-2).

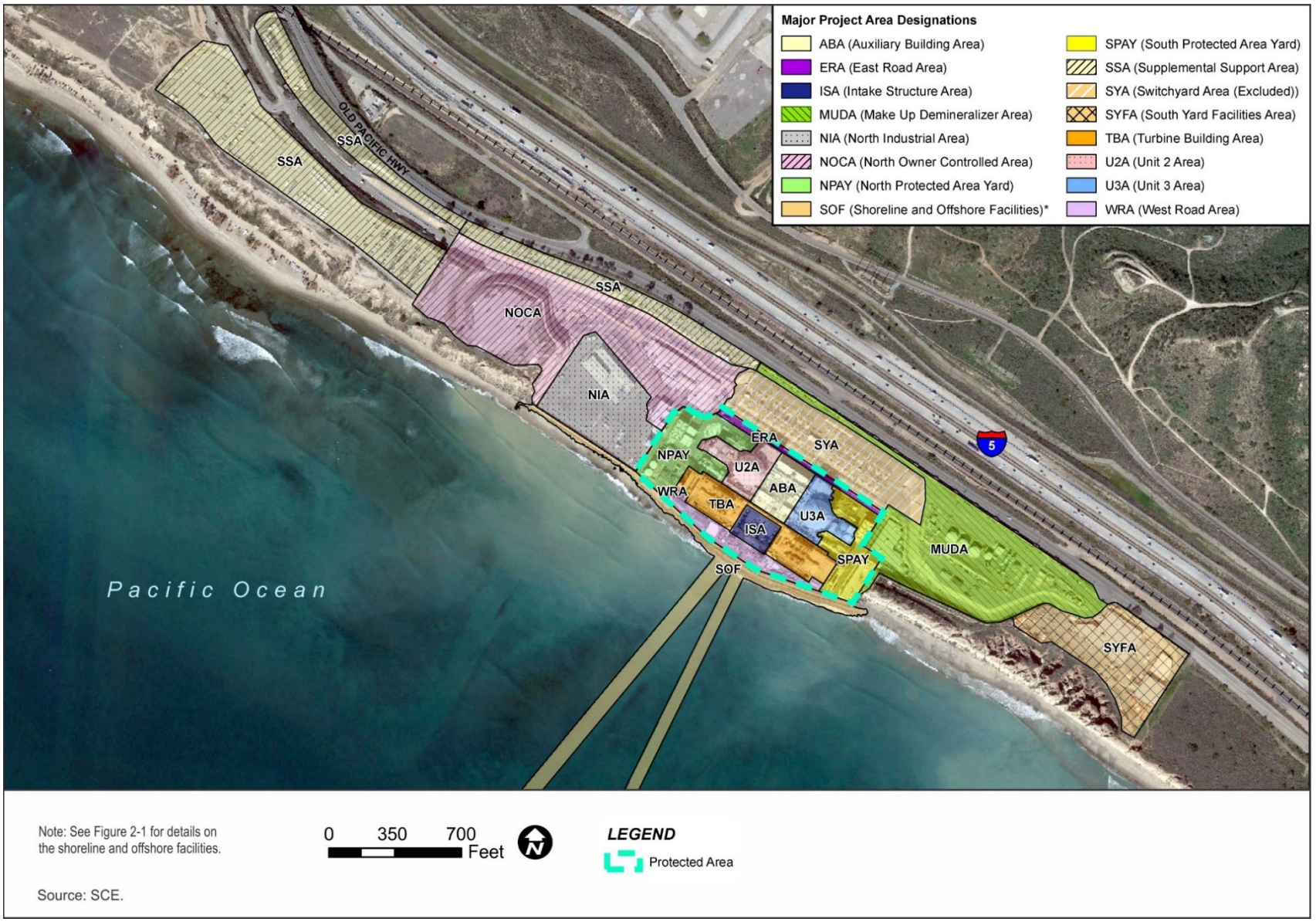
- Onshore Site: The Onshore Site is located entirely within the boundaries of MCBCP under DoN easements and leases. The site is bounded on the northeast by Old Pacific Highway, San Diego Freeway (Interstate 5 [I-5]), and railroad tracks owned by the North County Transit District of San Diego, on the northwest and southeast by San Onofre State Beach, and on the southwest by a seawall, walkway, and riprap, which separate the Onshore Site from the Pacific Ocean.

[14] In 2016, Pacific Gas and Electric Company (PG&E) announced that it will shut down California's last-operating nuclear plant, Diablo Canyon Power Plant (DCPP) in San Luis Obispo County, when DCPP's Units 1 and 2 NRC licenses expire in 2024 and 2025, respectively (California Energy Commission [CEC] 2016). Four other shut-down commercial nuclear power plants and an experimental power plant are in California: SONGS Unit 1 Pressurized Water Reactor; Humboldt Bay Nuclear Power Plant (Eureka); Rancho Seco Nuclear Power Plant (south of Sacramento); Vallecitos Boiling Water Reactor (Alameda County); and the Santa Susana Sodium Reactor Experimental sodium-cooled reactor (Ventura County).

Figure 2-1. Onshore, Shoreline, and Offshore Sites



Figure 2-2. Major Project Areas



- Shoreline Site: The Shoreline Site consists of a small strip of land between the Onshore and Offshore Sites. The site includes a seawall, a walkway that permits pedestrian transit between open beach areas up- and down-coast from SONGS, and riprap that armors the beach. The seawall and walkway are on DoN property. The riprap waterward of the ordinary high-water mark is within the CSLC Lease Facilities and riprap landward of the ordinary high-water mark is on DoN property.
- Offshore Site: The Offshore Site, which includes tide and submerged lands in the Pacific Ocean, southwest of the Onshore Site, consists of 21 acres (i.e., the majority of the CSLC Lease Facilities area) and includes the offshore conduits and associated appurtenances, environmental monitoring (of air and water temperature [SCE 2018j – DR#7-3]) and navigational buoys. Note: There are also 29 other locations designated by GPS coordinates only (no buoys) that serve as water quality and temperature monitoring locations stations. These 29 locations are accessed quarterly for surface-to-bottom temperature readings, as well as for the Radiological Environmental Monitoring Program and SONGS National Pollutant Discharge Elimination System (NPDES) permit requirements. Ten of these locations also take dissolved oxygen and acidity (pH) readings. (SCE 2018j – DR#7-3)

Table 2-2 identifies Major Project Areas that contain above- or below-grade subsurface structures, systems, and components (SSCs), buildings, roads, and other infrastructure. Table 2-3 provides additional information about the seawall, walkway, and riprap

Table 2-2. Major Project Areas and Major Components

Area (alphabetical)	**Major Components**
Auxiliary Building Area (ABA)	Spent Fuel Pool Island System Radioactive Waste (Radwaste) Area Control Area Penetration Areas Railroad Spur
East Road Area (ERA)	East Road (Protected Area) Hazardous Material Area Railroad Spur
Intake Structure Area (ISA)	Units 2 and 3 Intake Structures and Related Systems Unit 2/Unit 3 Radwaste/Steam Generator Blowdown Discharge Lines Forebay Access Bridge Traveling Screens Circulating Water Pumps Salt Water Pump Room Fish Elevator and Return Line Carbon Dioxide Tank Dilution Water Pumps

Table 2-2. Major Project Areas and Major Components

Area (alphabetical)	**Major Components**
Make Up Demineralizer Area (MUDA)	Parking Lot 2 (upper and lower) Make Up Demineralizer Make Up Demineralizer Control Building Demineralized Water Tanks Office Building K-40/K-50 Decommissioning Power Supply Backup Diesel Microwave Buildings and Tower South Access Road (portion), East MUDA Road, East Road (portion), and Switchyard Access Road Gunite Slope Protection[1]
North Industrial Area (NIA)	Wastewater Treatment Plant NIA Sump Demineralized Water Storage Tank Remnant Subsurface Structures and Soil Approved ISFSIs and Associated Facilities Unit 1 Reactor Vessel NIA Road Railroad Spur
North Owner Controlled Area (NOCA)	Administrative, Warehouse, and Shop Building North Security Processing Facility Central Processing Building (L-50) Reservoir/Helicopter Pad Areas Former N-Building Foundations Gunite Slope Protection[1] North Owner Controlled Area Road Railroad Spur
North Protected Area Yard (NPAY)	Unit 2 Hold Down Area Maintenance Buildings Unit 2 Diesel Generator Building Office Building (B-68/B-69) Oily Waste Holding Sump/Separator Fire Water Tanks/Pumps Diesel Fuel Tanks/Pumps Secondary Water Hold Up Tank Unit 2 Main Transformers Unit 2 Auxiliary Transformers Unit 2 Cable Tunnel North Road (Protected Area) Railroad Spur
Shoreline and Offshore Facilities (SOF)	Dilution Water Pumps Offshore Circulating Water Systems Conduits (Unit 2 and Unit 3) Seawall[2] Fish Return System Conduit Public Beach Access Walkway and Associated Riprap Environmental Monitoring and Navigational Buoys
South Protected Area Yard (SPAY)	Unit 3 Diesel Generator Building Unit 3 Main and Unit Auxiliary Transformers

Table 2-2. Major Project Areas and Major Components

Area (alphabetical)	**Major Components**
	Emergency Diesel Generator Tanks / Pumps South Services Buildings (K-10/K-20/K-30) South Security Processing Facility (K-70) Unit 3 Cable Tunnel South Road (Protected Area) Gunite Slope Protection[1]
South Yard Facilities Area (SYFA)	Multi-Purpose Handling Facility Building Hazardous Material Pad Radioactive Equipment and Material Radioactive Equipment and Material Storage Staging Pad South Yard Facility Building Parking Lot 1 South Access Road (portion) Gunite Slope Protection[1]
Supplemental Support Areas (SSA)	Parking Lots 3 and 4/4A Oil Separators in Storm Drain North Plant Access Road Railroad Spur
Turbine Building Area (TBA)	Units 2 and 3 Turbine Generator Buildings Unit 2/Unit 3 Steam Generator Blowdown System Units 2 and 3 Full Flow Condensate Polishing Demineralizer Buildings
Unit 2 Area (U2A) and Unit 3 Area (U3A) (these components are present in each area)	Containment Building and Contents (e.g., reactor vessel, reactor vessel internals, reactor vessel head, steam generator, pressurizers) Fuel Handling Building/Spent Fuel Pools Auxiliary Building Penetration Area Tank Enclosure Building Auxiliary Feedwater (AFW) Pump Room AFW Piping Tunnel Main Stream Isolation Valve Area Safety Equipment Building Underground Electrical Tunnel Railroad Spur
West Road Area (WRA)	Turbine Plant Cooling Water Surge Tanks Office and Maintenance Buildings Clean/Dirty Oil Tank Area Chemical Tank Area Various Pumps Unit 3 Radwaste Line/Pump Chemical Storage Building West Road (Protected Area) Underground Fuel Tanks for Auxiliary Boiler Intake Structure below Seawall Intake Structure Gates

Source: SCE 2016c – Table 3.

Notes:

[1] Gunite, a dyed concrete (or similar) material, covers the vertical bluffs and slopes at SONGS and a steel structure that is anchored to the bluff wall/slope using tie backs, soil nails, and rebar.

[2] The seawall spans several areas; it is included in SOF for clarity and brevity.

Table 2-3. Seawall, Public Beach Access Walkway, and Associated Riprap

Seawall	The 2,049-foot-long seawall runs parallel to the seaward boundary of the DoN Easement area and is comprised of two separate, contiguous parts: the 1,376-foot-long Units 2 and 3 seawall composed of reinforced concrete topped with a security fence; and the 673-foot-long steel sheet pile NIA portion of the seawall. The seawall is relied upon to function as a security barrier (SCE 2015d).
Public Beach Access Walkway	This 1,954-foot-long asphalt-paved walkway parallels the seawall and sits on top of compacted sand fill. The walkway is approximately 15 feet wide for most of its length, except for a small 30-foot-wide section at the northwest end. A low retaining wall borders the seaward side of the walkway.
Riprap	Riprap abutting the seaward side of the retaining wall was originally installed at a 2:1 slope and is composed of two layers (SCE 2016a – DR #1-20): a primary layer of rocks ranging in size from 3,500 to 5,900 pounds (75 percent weigh more than 4,700 pounds; and a secondary layer design that specifies rocks ranging from 350 to 590 pounds (75 percent weigh more than 470 pounds). Much of the riprap is covered by beach sand backfill. Some maintenance and restoration of the riprap may be required between now and the end of decommissioning.

2.2.2 Existing Project Setting (Approved and Completed Activities)

2.2.2.1 Approved Independent Spent Fuel Storage Installation ~~Expansion,~~ Operation~~,~~ and Maintenance (2015 – 2035)

The Approved ISFSI element of the SONGS Decommissioning Plan was approved by the NRC and ~~California Coastal Commission (~~the CCC~~)~~ and is part of the existing environmental setting. Because the Approved ISFSI has already been approved, constructed, and is in operation, and because the Proposed Project would not affect existing permit conditions associated with the Approved ISFSI or change the amount or method of SNF storage on site, the presence, operation, and maintenance of the Approved ISFSI is considered a baseline condition (see Section 1.5.1, *Baseline and Future Conditions*). The Approved ISFSI includes: (1) ~~the original above-grade~~ AREVA ~~facility portion of the ISFSI the CCC approved in 2001 (CDP No. E-00-014)~~ the 19 above grade fuel storage modules (original AREVA facility) used to store SNF from Unit 1, approved by the CCC in 2000 (CDP No. E-00-001); (2) the expansion to the original AREVA facility (additional 104 fuel storage modules) to store SONGS Units 2 and 3 SNF that was approved by the CCC in 2001 (CDP No. E-00-014); and (~~2~~3) the new partially below-grade ~~expansion~~ Holtec facility portion of the Approved ISFSI that was approved by the CCC ~~approved~~ in 2015 (CDP No. 9-15-0228; CCC 2015a) (see Table 1-2). Elements of CDP 9-15-0228 include:

- ~~Installation of the expanded~~ Construction of the Holtec facility portion of the Approved ISFSI, which was completed on January 19, 2018, and continued Approved ISFSI operation, maintenance, and retention of SNF on-site
- A condition requiring the Participants to return to the CCC in 2035 for a CDP amendment to retain, remove, or relocate the Approved ISFSI, or if an off-site

repository for SNF is approved and sited prior to 2035, to package and transfer SNF off-site (pursuant to all agency permit requirements) and remove and dismantle the Approved ISFSI

2.2.2.2 Ongoing Maintenance, Hazard Elimination, and Preparatory Activities

Baseline conditions also include ongoing maintenance, hazard elimination, and preparatory activities that have been completed or are ongoing, including:

- **Cold and Dark (C&D) Modifications**. C&D activities, which were completed to help achieve safe D&D operating conditions, included de-energizing the existing electrical infrastructure and replacing it with a temporary system (see Table 2-4).

Table 2-4. Cold and Dark (C&D) Modifications

C&D Modification	Summary of Need
Command Center Relocation	Designate a portion of former control room as the command center; controls removed, monitoring functionality only
Electrical Distribution for C&D Condition	Connect ring bus to power cabinets and equipment with proper controls
Fire Detection	Repurpose appropriate fire detection systems for C&D
HVAC Modifications: Control Building and Fuel Handling/ Radwaste Building	Remove automatic controls and lock damper positions in both buildings; installation of new chillers in Control Building
Ring Bus (12-kilovolt) Modifications	Provide power source to systems and construction activities from new transformers in SONGS' portion of the switchyard
Salt Water Dilution Pumps	Replace salt water cooling system to provide minimum pump flow needed to support waste discharge streams
Security Repower Modifications	Power security equipment from ring bus and emergency back-up diesel generators
Spent Fuel Independent Cooling and Purification	Eliminate reliance on ocean cooling
Spent Fuel Pool Makeup	Add pumping capacity and restore appropriate water source
Sumps: Radioactive and Non-Radioactive Modification	Replace pumps with submersible self-contained pumps; retain effluent monitoring controls; provide new liquid radwaste discharge line; retain radwaste process flowpath
Switchyard 220-kilovolt Control Facilities Separation	Remove switchyard controls from Units 2 and 3 control room
Telecommunications	Reconfigure to retain required functionality for balance of the SONGS Decommissioning Plan implementation

Source: SCE 2016a – Table 2.
Acronyms: HVAC = Heating, Ventilating, and Air Conditioning; radwaste = radioactive waste; SCE = Southern California Edison; SONGS = San Onofre Nuclear Generating Station

- **Transition Activities**. Limited maintenance is performed on existing SSCs that support security and emergency response functions, habitability, and continuing operations. Equipment and facility-related preparations include refurbishment or repair of existing equipment as needed. Ongoing activities also include continued implementation of multiple plans related to radiation protection, safety, security,

hazardous materials storage, Approved ISFSI SNF Management and other environmental considerations (see Section 2.2.3, *Decommissioning Plan Activities*).

- **Preparatory Cleanup.** Unused materials and equipment (e.g., spare parts, furniture, tools) have been removed from buildings and reused or disposed of in licensed facilities (see Section 2.2.3.7, *Waste Characterization and Management*).
- **Portal Monitors and Scales**. Portal monitors would be installed on ingress and egress routes to screen incoming and outgoing truck traffic for radioactive material. Scales may be installed to monitor compliance with weight limits for haul routes.

2.2.3 Decommissioning Plan Activities

Many ongoing safety and environmental-related activities occurring at SONGS would continue throughout SONGS Decommissioning Plan implementation and are not specific to the Proposed Project. Sections 2.2.3.1 through 2.2.3.8 and Table 2-5 summarize several of these activities, including some required by the NRC. New Proposed Project-specific plans and programs will also be developed (see Section 2.2.3.9, *Proposed Project-Specific Plans and Programs*).

2.2.3.1 Emergency Plans

Emergency planning enables personnel to rapidly identify, evaluate, and react to a broad array of emergencies. Pursuant to NRC regulations, an emergency plan integrates safety, security, and emergency preparedness with the primary mission to protect public health and safety. In December 2016, SCE submitted three license amendment requests to the NRC with respect to emergency preparedness, security, and plant technical specifications, all of which relate to Approved ISFSI-only operations.

Following removal of SNF from the reactors, an updated emergency plan was submitted to and approved by the NRC. Elements of this plan include: (1) emergency plan staff trained to address unanticipated events for a permanently defueled facility located on-site, 24/7; (2) on-site radiological and environmental monitoring and NRC inspections; (3) close coordination and communication with off-site partners and participation in the Interjurisdictional Planning Committee; and (4) frequent on-site emergency preparedness drills and routine fire, medical, and emergency communication drills with off-site partners.

Table 2-5. Ongoing and Proposed Plans, Programs, and Reports

Plan, Program, Report and effective date if applicable (alphabetical)	Required by NRC	Ongoing	To Be Developed during/ for Proposed Project	Summary	EIR section where discussed
Anchoring Plan – prior to start of offshore work			●	This Plan will describe offshore activities for which vessel anchoring is required, including: anchoring arrangements; procedures to deploy and recover anchors, laydown areas and avoidance of hard substrate.	2.2.3.9, *Proposed Project-Specific Plans and Programs* 2.3.6.4, *Offshore Dispositioning Approach*
Conduit Work Plan – prior to start of offshore work			●	This Plan will outline the approach to ~~offshore~~conduit CSLC Lease Offshore Activities, including the means, methods, and vessels to be used.	
Dredging Plan (to be developed by selected contractor) – prior to start of offshore work			●	This Plan will describe the means, methods, and vessels used for dredging to provide access to the offshore conduit structures proposed to be removed, and how that material will be managed.	
Emergency Plans: **SCE Permanently Defueled Emergency Plan** – 2017 (existing); **SCE ISFSI Only Emergency Plan** – following transfer of spent fuel from wet to dry storage; **DGC Emergency Preparedness & Response Plan** – 2018	●	●		These Plans, prepared by the DGC under contract to SCE, supplement the SCE Emergency Plan and support radiological assessments, plant system engineering, repair and corrective actions, "in-plant" announcements and First Aid. Letters of Agreement will be maintained with off-site agencies to provide fire-fighting, rescue operations, medical transportation, and hospital/medical services. As an NRC Licensee, SCE retains responsibility for emergency preparedness and maintains a defined program and resources to respond and mitigate any off normal or abnormal events.	2.2.3.1, *Emergency Plans*
Grading Plan (Interim and Final) – prior to completion of Proposed Project (for Interim Plan)			●	An Interim Plan that incorporates emergency access, stormwater conveyance, and other applicable features may be developed for the Proposed Project. The Final Plan will include landowner requirements to achieve final site grade associated with the Future Activities.	2.3.14, *Site Conditions at End of Proposed Project*
Groundwater Protection Program[1] – existing and ongoing	●	●		The ~~p~~Program specifies actions to implement and objectives for a timely, effective groundwater protection program.	2.2.3.6, related to Groundwater Protection
~~**Habitat Restoration and Revegetation Plan**~~			~~●~~	~~This plan will address impacts to native vegetation, habitats, and sensitive plants and include planting plans and weed control.~~	~~*4.4.5, Environmental Impact Analysis and Mitigation*~~
Hazardous Materials Business Plan[1] –		●		This Plan, administered by the County of San Diego Dept. of Environmental Health, Hazardous Materials Division, includes a detailed inventory	2.2.3.6, *Spill Prevention and Response and*

Table 2-5. Ongoing and Proposed Plans, Programs, and Reports

Plan, Program, Report and effective date if applicable (alphabetical)	Required by NRC	Ongoing	To Be Developed during/ for Proposed Project	Summary	EIR section where discussed
existing (updated at least annually)				of on-site hazardous materials, emergency contacts, a site plan, and response strategies.	*Groundwater Protection*
Historical Site Assessment (HSA) / Site Characterization Report –2015	●	●		The HSA and Site Characterization Reports are NRC requirements for a licensee's License Termination Plan and describe, among other things, the level and locations of radiological contamination across the site.	2.2.3.4, *Site Characterization*
Hydrogen Sulfide (H_2S) Gas Control Plan			●	This ~~p~~Plan will include an inspection of the offshore conduits to determine if H_2S gas occurs at levels to pose a danger of release and subsequent mortality of listed marine species.	*4.4.5, Environmental Impact Analysis and Mitigation*
Marine Mammal and Sea Turtle Mitigation and Monitoring Plan			●	This Plan will ensure that no harassment of marine mammals or other marine life occurs during Proposed Project activities.	
Offshore Spill Response Plan – prior to start of offshore work			●	This Plan will present the procedures and protocols to be used if an oil spill results from the ~~conduit disposition~~CSLC Lease Offshore Activities ~~activities~~. The plan, which will be reviewed and approved by the Office of Spill Prevention and Response, will discuss or describe the following elements: (1) Sources of hydrocarbons (fuel or lubricant leaks or spills from onshore and marine equipment used during dispositioning); (2) Oil Spill Response Team and equipment; (3) Notification process; and (4) Marine Spill Scenarios/Response Procedures	2.3.6.4, *Offshore Dispositioning Approach*
Physical Security Plan – existing (updated periodically)	●	●		This Plan, which is classified as Safeguards Information and is controlled according to NRC regulations, has measures to protect nuclear facilities and material against sabotage, theft, diversion, and other malicious acts.	2.2.3.2, *Physical Security Plan*
Project Execution Plan or Program (developed by DGC) – prior to start of D&D			●	The DGC's Project ~~e~~Execution ~~p~~Plan or ~~p~~Program specifies requirements or controls that must be in place before or during demolition of individual structures or groups of structures.	2.3.2.3, *General Approach to Structure Demolition*
Radiation Protection Program	●	●		This Program ensures employees are qualified and capable of conducting all operations safely and in compliance with applicable regulations and are trained to respond to emergencies. The Program includes: (1) administrative control of on-site personnel to ensure that exposure to radiation, especially during emergencies, is	2.2.3.3, *Radiation Protection Program*

Table 2-5. Ongoing and Proposed Plans, Programs, and Reports

Plan, Program, Report and effective date if applicable (alphabetical)	Required by NRC	Ongoing	To Be Developed during/ for Proposed Project	Summary	EIR section where discussed
				within 10 CFR Part 20 guidelines and kept ALARA; (2) administrative control to ensure any effluent releases are below regulated concentrations and do not exceed dose values outlined in the SONGS ODCM; and (3) technical support in the event of emergencies.	
Soil and Groundwater Site Characterization ~~Study~~ and Soil Management Plan			●	This ~~study~~Plan will be used for non-radiological contamination testing for unknown contaminated soil and groundwater, to prevent worker exposure to hazardous chemicals.	*4.1.1, Environmental Impact Analysis and Mitigation*
Spill Prevention Control and Counter-measure (SPCC) Plan; linked **Spill Contingency Plan**[1] – existing/updated every 5 years		●		The SPCC Plan, based on 40 CFR Part 112, is required for oil capacity greater than 1,320 gallons above ground, and describes equipment, containment, monitoring, and related components used to prevent and manage oil releases. Subsets of these requirements include the Spill Contingency Plan, spill reporting, and the Hazardous Materials Business Plan.	2.2.3.6, *Spill Prevention and Response and Groundwater Protection*
Stormwater Pollution Prevention Plan (SWPPP) (includes plan for temporary water drainage and erosion control) – 2018		●	●	The SWPPP will comply with General NPDES Permit for Construction Stormwater Discharges (NPDES No. CAS000001/Order No. 2009-0009-DWQ, as amended) by including site-specific best management practices, frequency of routine inspections, inspection checklist, construction stormwater monitoring program and reporting for the Proposed Project duration. Amendments to the SWPPP will reflect final site design.	2.3.14, *Site Conditions at End of Proposed Project*
Survey Plan – prior to start of offshore work			●	This Plan will be prepared once the spent fuel pools and reactor cavities are empty and the conduits are no longer needed for Proposed Project activities. Similar to prior surveys, the Plan will outline how the DGC will survey the conduits to determine the level, if any, of any radiological material in or around the conduits.	
Walkway Flood Protection Plan			●	This Plan will address drainage discharge as it relates to discharging surface waters directly onto the surface of the public access walkway.	*4.9.4, Environmental Impact Analysis and Mitigation*

Table 2-5. Ongoing and Proposed Plans, Programs, and Reports

Plan, Program, Report and effective date if applicable (alphabetical)	Required by NRC	Ongoing	To Be Developed during/ for Proposed Project	Summary	EIR section where discussed
Waste Management Program – 2017	●	●		This Program, which the DGC has assumed responsibility for, includes procedures describing the disposal of radiological and non-radiological waste from the SONGS. The Program involves required training and provides for the packaging and transport of different types of waste in compliance with regulatory requirements.	2.2.3.7, *Waste Characterization and Management*
Wastewater Discharges – existing/ updated every 5 years		●	●	SONGS discharges are, and would continue to be, covered by its Regional Water Quality Control Board NPDES permit and ODCM.	2.2.3.8, *Water Processing*

Acronyms: ALARA = as low as reasonably achievable; DGC = Decommissioning General Contractor; ISFSI = Independent Spent Fuel Storage Installation; NPDES = National Pollutant Discharge Elimination System; NRC = U.S. Nuclear Regulatory Commission; ODCM = Offsite Dose Calculation Manual; SCE = Southern California Edison.

Note: [1] Applicable regulations or guidance: Groundwater Protection Program (Industry Groundwater Protection Initiative guidance [Nuclear Energy Institute 2007]); Hazardous Materials Business Plan (Health & Saf. Code, § 25505 and San Diego Code of Regulatory Ordinances § 68.1113. Health Permit Establishment # HK07-104692); SPCC Plan (40 Code of Federal Regulations part 112); Spill Contingency Plan (Cal. Code Regs., tit. 22, § 4.5, ch. 4.5, art. 4, Contingency Plan and Emergency Procedures).

2.2.3.2 Physical Security Plan

Personnel and physical security requirements would be maintained and evolve as the quantity and configuration of radiological material is reduced or eliminated.

2.2.3.3 Radiation Protection Program

Per the Radiological Protection Program, areas of the Proposed Project site are identified and categorized (e.g., high radiation, contaminated) and appropriate controls (e.g., physical barriers, monitors, detectors) are established and maintained.

2.2.3.4 Site Characterization

In 2015, SCE completed an initial Historical Site Assessment (HSA) of the SONGS site (SCE 2015a) and a Site Characterization Report that evaluated the location, type, and level of radioactive and other hazardous materials present, including hazardous and radiological assessments of SSCs, site soils, and building materials (SCE 2015b). Site characterization will continue throughout the decommissioning process.

2.2.3.5 Spent Nuclear Fuel Management

As discussed in Sections 1.2.1.2, *U.S. Nuclear Regulatory Commission*, and 1.2.1.3, *Federal Preemption*, the NRC has complete oversight and compliance authority over the management and storage of used nuclear fuel (SNF) at commercial nuclear reactor facilities. SCE stores SNF at SONGS using enclosed steel-lined pools (wet storage) and the Approved ISFSI (dry storage with a passive cooling system independent of an external power source). In 2017, SCE completed ~~its ISFSI expansion~~ construction of the Holtec facility portion of the Approved ISFSI and began moving SNF from the fuel pools into the Approved ISFSI on January 22, 2018 (to be completed by the end of 2019). The SNF will remain in on-site dry storage during decommissioning until ~~the U.S. Department of Energy (DOE) approves~~a government-approved interim storage facility or permanent ~~a~~ repository becomes available. ~~and accepts the SNF for interim storage or permanent disposal pursuant to the Nuclear Waste Policy Act and conforming contracts.~~

2.2.3.6 Spill Prevention and Response and Groundwater Protection

The SONGS existing Spill Prevention Control and Countermeasure (SPCC) Plan requires a response plan for potential oil spills and is linked to a hazardous material Spill Contingency Plan and Hazardous Materials Business Plan. These plans are filed with and regulated by the San Diego County Department of Environmental Health, satisfy the Treatment Storage and Disposal Facility Permit requirements for SONGS mixed waste (waste containing both hazardous and radioactive materials). They would be updated as plant systems are removed from service, and petroleum/fuel tanks are added. During decommissioning, a designated area would be set up to refuel equipment using best management practices to reduce potential leaks during refueling. In addition, groundwater monitoring would continue at SONGS on a regular basis in accordance with the Groundwater Protection Initiative, which applies to both operating nuclear power plants and plants being decommissioned.

2.2.3.7 Waste Characterization and Management

Hazardous materials on-site include radioactive materials regulated by the NRC and non-radioactive materials including asbestos, chromates, lead paint, and polychlorinated biphenyls. Hazardous waste characterization and management directly impact decisions related to radiation protection and the scope of decontamination. Removal of hazardous material early in the process can help minimize potential exposure to personnel during D&D activities and reduce any cross contamination into other waste streams. Hazardous material abatement was performed during SONGS operation. Hazardous materials were also identified during site characterization and would continue to be removed, packaged, and disposed of in accordance with applicable regulations for each waste type (e.g., contaminated SSCs, contaminated soil, resins, water, other plant process liquids) as described in the Waste Management Program, which has been transitioned to the DGC (see Table 2-5 above). The program includes an evaluation of available methods and

strategies for radioactive waste processing, packaging, and transport in conjunction with available disposal facilities and associated waste acceptance criteria. NRC Regulation 10 CFR Part 61 controls low-level radioactive waste (LLRW) disposal. For each waste classification, 10 CFR Part 61 stipulates criteria for physical and chemical properties that LLRW must meet to be accepted at a licensed LLRW disposal site. LLRW generators determine the proportional amount of several radioactive isotopes present in each container of disposable LLRW using a combination of analytical techniques (e.g., direct assay methods, sample laboratory analyses, and computerized analyses), then classify the waste as Class A, B, C, or Greater than Class C (GTCC; e.g., reactor vessel internals), as defined in 10 CFR Part 61.

The type of Class A waste container is based on the transport mode (e.g., rail, truck, barge) and waste form; quantity is based on the most restrictive of either container weight limit or container volume limit. Large components (e.g., steam generators, pressurizers, and reactor recirculation pumps) could be shipped as their own containers with shielding as required or cut into smaller pieces and packaged in containers that meet regulatory requirements. Selection of the type and quantity of containers required for Class B and C wastes is determined by the most restrictive of curie content, dose-rate, container weight limit, or container volume limit. GTCC waste from segmentation of the reactor vessel internals would be packaged in dry storage systems and placed at the Approved ISFSI.

Decommissioning Plan activities would not likely generate new mixed waste. If mixed waste is generated, it would be rendered non-hazardous or transported by authorized and licensed transporters from SONGS to licensed facilities in accordance with applicable federal and state regulations. Universal wastes (e.g., batteries, electronics, and mercury-containing equipment [thermostats and lamp bulbs]) would be collected, separated by category and disposal destination, then shipped to a facility that treats, disposes of, or recycles each category of universal waste (see Section 2.3.8.2, *Disposal Sites*).

2.2.3.8 Water Processing

All water from the D&D of radiological buildings (e.g., Containment Buildings, Auxiliary Building [Radwaste Area], and Fuel Handling Buildings) would be processed using existing plant equipment or new modular units that would be delivered on one or two tractor trailers and located on-site or mounted on skids and placed within existing structures (SCE 2016a – DR #1-8). During decommissioning, water would be pumped from the spent fuel pools and refueling pools and collected from drained systems, floor drains, and sumps. The water would be processed to less than 10 CFR Part 20 limits using mechanical filtration, charcoal filters, or ion exchange resin beds and sampled; if the processed water meets discharge limits it would be discharged through the Unit 2 discharge conduit in the same manner that liquid waste was processed while SONGS Units 2 and 3 were operating in accordance with the facility's Regional Water Quality

ontrol Board (RWQCB) National Pollutant Discharge Elimination System (NPDES) and the SONGS ODCM (NUREG-1301).

2.2.3.9 Proposed Project-Specific Plans and Programs

Major dismantlement work would start after CEQA review and permitting is completed. The Proposed Project scope, methods, work locations, and construction details are described in Section 2.3, *Proposed Project Activities*. The Participants and the DGC would implement the various plans and programs, including those listed in Table 2-5).

2.3 PROPOSED PROJECT ACTIVITIES

Most radiological decontamination work at SONGS would occur as part of the Proposed Project, except for the Approved ISFSI and SONGS Unit 1 remnants below the Approved ISFSI. This would involve decontamination, dismantlement, and removal of certain above- and below-grade facilities and transport to a licensed disposal facility. Proposed Project work would occur in all the Major Project Areas (see Table 2-1 and Figure 2-2); however, only limited ground-disturbing activities would occur in the Approved ISFSI portion of the North Industrial Area (NIA). D&D activities would be concentrated in areas disturbed during SONGS operations, which are covered with asphalt, concrete, or gravel with minimal vegetation. Figure 2-3 depicts the future state of the SONGS site after Proposed Project completion. Facilities that would remain after completion of the Proposed Project are the Approved ISFSI, switchyards and support structures, seawall/walkway/riprap, gunite slope protection, a portion of rail tracks, intake/discharge structure beneath the seawall, and SDG&E microwave building, tower, and support structures. SONGS Unit 1 SSC remnants below the Approved ISFSI would be addressed during Future Activities after all SNF is moved off-site.

2.3.1 Onshore Site Preparation

The SONGS infrastructure must be prepared for D&D activities, including appropriate management of waste materials generated during decommissioning. The Project ~~e~~Execution ~~p~~Plan developed by the DGC would identify specific locations. This requires:

- Establishment of staging, laydown, and storage areas
- Identification of Radiological Controlled Areas (RCA; any area where levels are high enough that radiological protection controls must be implemented), Radioactive Material Areas (RMA; restricted areas), and Protected Areas (PA; an area encompassed by physical barriers to which access is controlled).
- Access to the SONGS site, work areas, and conveyance (i.e., truck and rail) to be used to transport loaded waste containers to a final disposal site (see Figure 2-4)
- Reconfigurations or improvements to existing roads, entrances, rail infrastructure
- Power supply, utility, and equipment preparations

Figure 2-3. Remaining Above-Grade Facilities at End of Proposed Project



Figure 2-4. Site Access and Roads



2.3.1.1 Staging, Laydown, and Storage Areas

Decommissioning requires the establishment of staging, laydown, and storage areas for equipment (e.g., cranes, manlifts, forklifts, graders, and excavators) and materials, waste material segregation and management, temporary storage, and truck and rail loading that would be located within the SONGS boundaries in areas already disturbed by SONGS operations (Figure 2-2) including, in alphabetical order (SCE 2016a – DR #1-24):

- Auxiliary Building Area (ABA) (~ 1.7 acres)
- Intake Structure Area (ISA) (~ 0.5 acres)
- Make Up Demineralizer Area (MUDA) (~ 7 acres)
- North Owner Controlled Area (NOCA) (~ 8 acres)
- North Protected Area Yard (NPAY) (~ 3.4 acres)
- South Protected Area Yard (SPAY) (~ 2.4 acres)
- South Yard Facilities Area (SYFA) (~ 6.4 acres)
- Supplemental Support Area (SSA) Parking Lot #4 (~ 11 acres)
- Turbine Building Area (TBA) and West Road Area (WRA) (~ 2 acres each)
- Unit 2 and Unit 3 Areas (U2A and U3A) (~ 1.2 acres each)

Staging areas for truck and rail conveyances would be located near waste generation areas to minimize waste handling and vehicle traffic. Laydown and storage areas would be established for unloaded/loaded waste containers awaiting loading by truck or rail. Depending on radiation dose and contamination levels, containers with radioactive material would remain in a RMA (such as the NPAY or a similar restricted area) or RCA until ready for transport off-site. As D&D activities progress, areas that once contained structures (e.g., administrative buildings) would be converted to useable work space.

2.3.1.2 Access

D&D activities require access to support the ingress and egress of people and equipment to perform the work. Existing access points for the site are located at the north and south ends of the site off Old Pacific Highway. Inside the site, two access points lead into the existing PA, which is protected by fencing and intrusion detection, and monitored by closed-circuit television. Site preparation may include upgrading or modifying the access points to better suit the D&D equipment and personnel flow.

2.3.1.3 Road and Entrance Reconfigurations and Rail Improvements

Existing roads and paths within the Onshore Site may be rearranged to maximize work areas and accommodate vehicle and equipment flow in the NOCA and PA access points. Paving would be removed in most areas, resulting in about 65 acres of unpaved areas; 35 acres would remain paved, including (by size): parking lots (~ 19 acres); Switchyard Area (SYA) (~ 7 acres); NIA (~ 6 acres); access roads (~ 2 acres); and public beach access walkway (~ 1 acre) (SCE 2016a – DR #1-25). As D&D activities progress, heavy

equipment and truck volume may require roads and parking lots to be repaired or maintained and access to be modified. Access road improvements or reconfigurations would occur only in disturbed areas. All security features would remain.

Proposed Project upgrades to the existing rail spur, rail staging, switching equipment, and signals may also occur to streamline waste transport by rail. The rail spur provides access to the Onshore Site from the main rail line next to SONGS' east side. If it cannot accommodate the planned volume of D&D shipping activity it would need to be upgraded to stage empty and loaded rail cars. The Proposed Project anticipates: an estimated 0.5 to 1.0 mile of new rail improvements within existing developed areas; modification of the existing rail alignment near the Administrative, Warehouse, and Shops Building; installation of a new switch on two existing spurs on the east side of the Fuel Building to stage railcars (SCE 2017b); and changes to the site's rail entrance point (Figure 2-4).

2.3.1.4 Temporary Power Supply and Utilities and Equipment Preparation

DGC D&D preparatory activities related to power supply, utilities, and equipment use may require the items below (see Section 2.3.10~~3~~, *Water Use and Power Supply*).

Power Supply and Utility Preparation

- Temporary lighting and power
- High-efficiency particulate air ventilation systems
- Temporary, portable water treatment systems
- Portable sanitary facilities
- Potable water distribution
- Communication infrastructure
- Temporary fire suppression

Equipment Preparation

- Cranes (lattice boom, knuckle boom)
- Material handling devices
- Temporary lifting devices
- Temporary office facilities
- Concrete reduction (crushing) equipment

2.3.2 Decontamination and Dismantlement

Proposed Project activities include dismantling and segmenting Containment Building internals, removing Containment Buildings, removing or decontaminating radiologically contaminated SSCs to achieve NRC release criteria, and removing some non-contaminated SSCs and other infrastructure not required for the Approved ISFSI or switchyard. Typical methods for each activity, based on industry standards and common best practices, are described below (the DGC would propose specific work methods).

2.3.2.1 General Approach to System and Component Removal

Before site buildings are demolished, each building or structure (whether contaminated or non-contaminated) would be prepared by clearing selected interior SSCs. The initial Site Characterization Report (AREVA 2015a) identifying hazards and contaminants would be used to guide the DGC's initial D&D activities and would be supplemented by

ongoing site characterization throughout the D&D process. At the end of the Proposed Project, the DGC would prepare a Final Site Characterization Report.

Controlling the spread of radioactive or other hazardous materials during SSC removal is accomplished using industry standard control methods based on the degree of contamination. A typical approach is to isolate the immediate work area from other areas, control access into that area, and cover or apply a protective coating or fixative (referred to as "lockdown" and typically a polymer-based latex paint) to lock down contamination once an SSC is removed from its installed location. Several SSC dismantlement and removal examples are provided below.

- For a building or other structure containing SSCs with high levels of radioactivity, these SSCs would be dismantled and removed while the structure is intact (i.e., before structure demolition), as appropriate. The structure provides a confinement to prevent the release of radioactive materials to the environment.
- Where minimally contaminated or non-contaminated systems are present (e.g., in the Turbine Building), SSCs may be removed during structure demolition. Heavy equipment would demolish the SSCs into a large rubble pile, with the material then segregated by types or waste stream, as required.
- In a structure with both hazardous and non-hazardous SSCs, contaminated SSCs would be removed. Remaining non-hazardous SSCs would be removed during structure demolition using heavy equipment, as appropriate.
- Non-hazardous SSCs would be sorted or segregated as required for disposal as part of particular waste streams.

Any SSCs that remain below grade would be backfilled, grouted, plugged, or filled with concrete (SCE 2016a – DR #1-5) or similar material, so as not to create a void space over time after the area is backfilled. Similar materials to achieve the dense structure of concrete could include a low density flowable fill or cellular concrete material (tradename Elastizell). It is similar to concrete in that it is cementitious (mostly cement and water). It differs from normal concrete in that admixtures and equipment are used to entrain significant amounts of air, which results in a much lower density. This material has sufficient strength to meet engineered fill requirements and it does not pose a hazard to the environment (SCE 2018l). Most SSCs would be removed from within structures (see Section 2.3.4, *Other Structures Systems and Components: Removal Methods*). Local suppliers would provide soil and slurry backfill, if needed; a concrete batch plant would not be installed on-site (SCE 2017b).

2.3.2.2 General Approach to Decontamination

The Proposed Project includes decontamination of SSCs to meet NRC radiological remediation requirements. The DGC would implement a Radiological Protection Program (see Table 2-5) in accordance with NRC regulations (e.g., see 10 CFR Part 20.1003) that

require radiation exposures be maintained in accordance with ALARA (As Low As Reasonably Achievable) (SCE 2017b). General approaches to decontamination are: (1) complete removal of the component or structure, (2) surface decontamination, or (3) a combination of both approaches. All these approaches segregate waste streams to meet disposal requirements. Ultimately, all above-grade SSCs would be removed, but surface decontamination may first be used to reduce overall volume of radioactive waste.

All on-site waste handling operations would comply with approved radiation and waste-handling procedures and applicable hazardous and radiological safety regulations. Established procedures could include the use of: a protected laydown area for removing and staging large pieces of contaminated concrete outside; fixative material or plastic wrapping for moving contaminated items, such as large pieces of concrete in open air; and waste containers for smaller pieces. Multiple temporary containment enclosures would likely be installed to allow for demolition and loading/unloading of materials before moving to the truck or rail conveyance for shipment. These temporary enclosures would not exceed the height of the containment domes.

As shown in Figures 2-5 and 2-6, the SONGS protected area (PA) includes below-grade SSCs. Based on industry experience, decontamination work would include removal of all structures to a minimum of approximately 3 feet below existing local grade (to 27 feet Mean Lower Low Water [MLLW] in the PA). Certain structures may require removal to approximately 21 feet below local grade (to 9 feet MLLW in the PA) or, in limited cases, more, based on the following considerations:

- The extent needed to meet regulatory radiological/hazardous material limits
- The ability to safely access SSCs requiring D&D
- The ability to safely perform Final Status Surveys (FSSs) on the SSCs
- Whether abandoning the SSCs in place would create a substantial void

If a surface decontamination approach is used, the extent of the effort is informed by the site characterization for that area. Typically, the contaminated top surface of the concrete is removed to meet pre-established open-air demolition criteria, leaving contamination-free walls, ceilings, and floors to be demolished as a typical industrial structure. Surfaces can be decontaminated using a variety of techniques and equipment selected based on safety, the extent of contamination, and effectiveness of the decontamination technique. Some examples of industry standard decontamination techniques are listed below.

- **Concrete Scabbling** is a common, relatively quick method that can generally remove the first 0.25 inch of contamination on exposed concrete surfaces. Scabbling equipment uses pneumatic pistons to break the concrete surface. It is noisy and creates dust, but usually has built in systems to collect dust and debris.

Figure 2-5. SONGS Units 2 and 3 Cross Section (North to South)

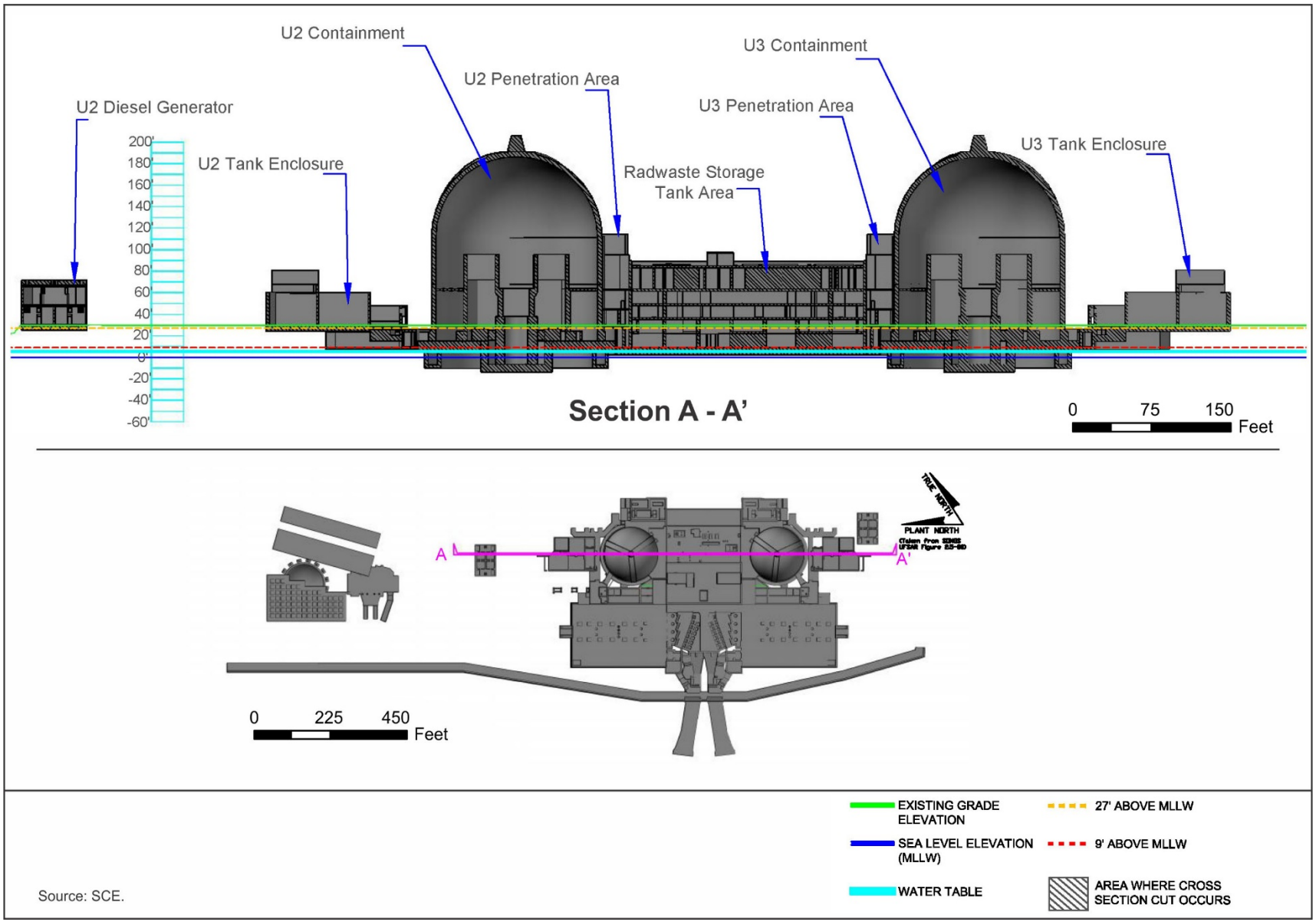
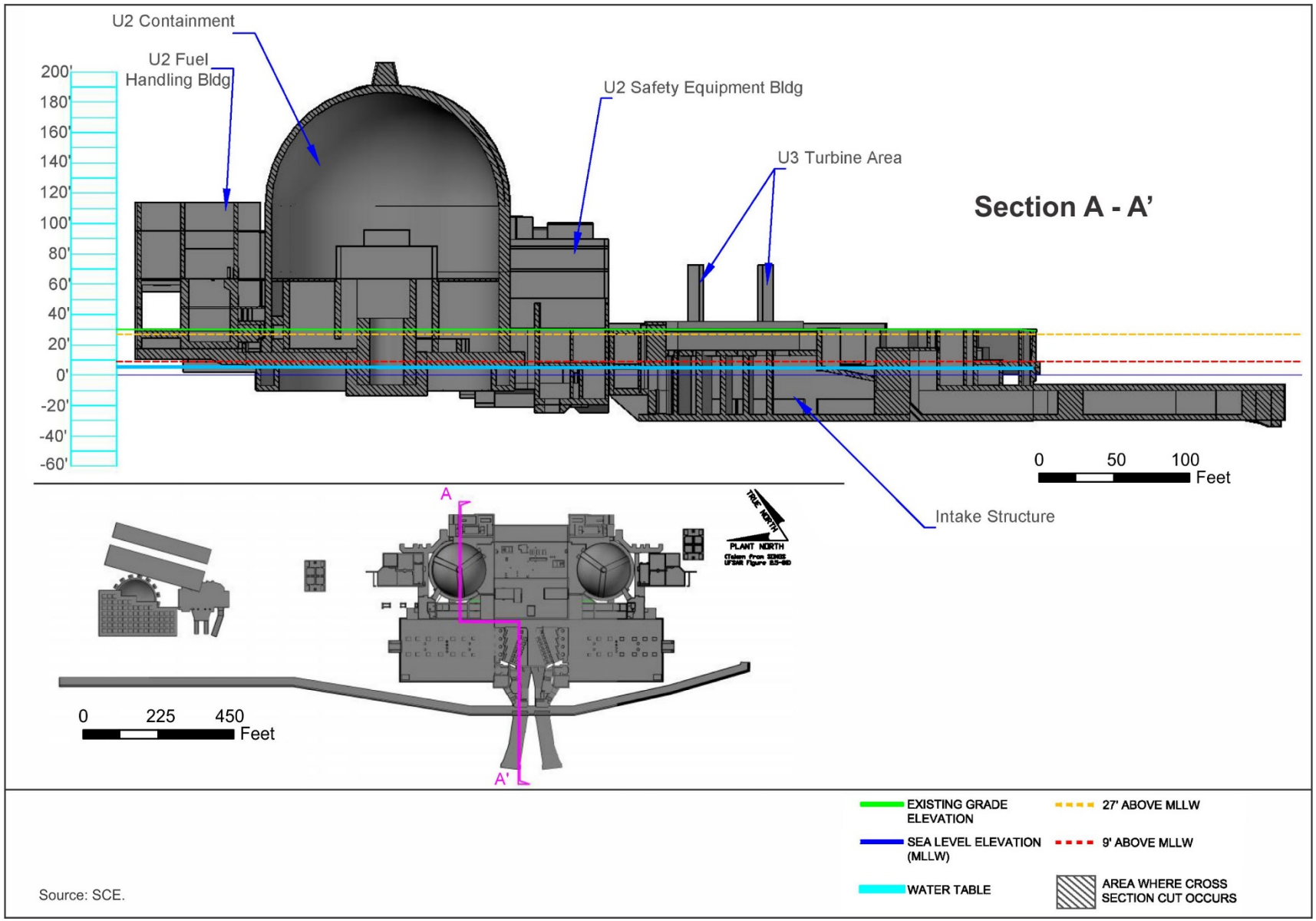


Figure 2-6. SONGS Units 2 and 3 Cross Section (East to West)



- **Concrete Shaving** is another frequently used method to remove exposed surfaces of concrete or surface coating/paints. Shaving of floors, ceilings, and walls is commonly used during minor decontamination or paint removal. Shavers are noisy and generate dust but often have built-in vacuum units that attach to the final disposal drums and filter exiting air, achieving nearly 100 percent collection.
- **Grinding** using abrasive grinders is another option to remove paint or surface areas of concrete and steel. These could be as simple as flapper wheels in hand drills. More complex tools have steel disks that can be used for material removal.
- **Needle Scaling** uses hand tools with several steel needles that pound into surfaces, breaking apart very small pieces of concrete. Most of these hand tools have attachments to collect dust and debris. These are useful where the surface is not flat, and when scabbling and shaving units would not be efficient.
- **Abrasive Blasting** is like sandblasting, where one of several types of abrasive materials is blasted against the surface to be removed. This can produce large quantities of secondary waste that the equipment may or may not be able to reuse. This method is advantageous for accessing corners and other hard-to-reach areas.
- **Hydrolazing**, which uses a high-pressure water jet, is one technique to decontaminate steel liner walls in the Spent Fuel Pool and Reactor Pool Cavity.

2.3.2.3 General Approach to Structure Demolition

SSCs would be decontaminated to facilitate open-air demolition. Structures are proposed to be removed to 3 feet below existing grade (so that nothing remains above the existing local grade level, with removal to greater depths as needed) to achieve proper backfill compaction and eliminate void spaces. Structures located below grade include concrete slabs, underground storage tanks, support stanchions, utility vaults, sumps, vehicle barriers, building foundations, tunnels, and similar items. Below-grade interior walls and floors (except for foundation slabs) are typically removed to eliminate the need to perform ~~Final Status Survey~~FSS on these surfaces. Tunnels may also be collapsed to eliminate void spaces or opened to allow future backfilling of the area. Structure demolition may be performed in parallel with SSC removal, based on the selected SSC removal approach.

Prior to performing large-scale structure demolition, the structure must meet pre-established open-air demolition criteria that meet NRC public dose limits at the site boundary using Offsite Dose Calculation Manual (ODCM) methodologies. These criteria are based on residual contamination levels on structure surfaces or within an SSC, and are intended to ensure radiological material is not released to uncontrolled areas or the environment. SSCs that do not meet the open-air criteria would either be protected to ensure large-scale demolition techniques do not pose hazards to personnel or the environment or be surgically removed prior to commencing open-air structure demolition.

The DGC's Project Execution Plan or Program (see Table 2-5), which specifies requirements or controls that must be in place before or during demolition, would incorporate strategies to govern demolition of individual structures or groups of structures. If a structure does not meet the open-air criteria, it may be contained inside a temporary enclosure, with appropriate ventilation and filtration to prevent contamination spreading to uncontrolled areas. As described above, large containment enclosures may be constructed over building locations to allow demolition of building structures. None of the containment enclosures would be higher than the existing containment domes.

A common approach to structure demolition is to use multiple pieces of mechanical equipment with appropriate end tool attachments working simultaneously to collapse the structure into its footprint. Debris created would be reduced in size as needed for efficient waste packaging and sorted/segregated based on its waste classification. Using appropriate tools, thick concrete structures may be cut into blocks that can be removed and shipped. The debris would be loaded into approved waste containers for transportation to the licensed disposal facility. Remaining below-grade structures would likely have penetrations and accessible or embedded piping. The proposed final condition of the structures at the end of the Proposed Project is described below.

- All SSCs, including exterior structure walls and floor slabs, removed to at least 3 feet below existing local grade
- Most systems and components greater than 3 feet below grade (except for some embedded pipe) also removed
- Most interior walls and floors greater than 3 feet below grade removed to lowermost elevations, leaving intact lowest floor slabs

Backfill material would be placed on top of the remaining structures. SCE and its DGC would identify a material during SWPPP development that would be compatible with the surrounding natural environment (i.e., grain size, texture, and color) and that meets permit stabilization requirements. The permanent backfill requirements, which could include retention of the interim backfill following completion of the Future Activities, would be subject to landowner and permitting agency environmental review and approval (SCE 2018g). On sloping grades, consideration would be given to allow for sloping the structure during demolition or a stair-step removal to ensure the final grade provides adequate slope for drainage. The amount of below-grade structure removal onshore would be based on NRC unrestricted use release requirements. Additional below-grade structure removal may occur as part of the Future Activities depending on the end-state requirements for the Onshore Site, as determined by the DoN.

The precise amount of soil excavated to complete Proposed Project decommissioning activities is unknown. For this impact analysis, an order of magnitude estimate of onshore soil excavation volume is 1,458,000 cubic feet. This assumes (SCE 2016a – DR #1-88):

- Excavation, if necessary, around the Containment Buildings, to create a bench at the elevation of the mat slab with an 80-foot-wide base to a depth of 15 feet and a 1:1 slope to grade around the perimeter of the structure
- Excavation, if necessary, on the east side of the Fuel Handling and Rad ~~W~~waste Buildings and the Turbine Buildings at a 0.5:1 slope
- Excavation at the Tank Buildings and Generator Buildings to a depth of 3 feet by 10 feet wide at a 1:1 slope
- Ramps for access to Turbine Building areas
- Layback of retaining wall at north end of NIA at a 2:1 slope
- Six (6) inches of excavation in all paved areas to be removed

This would provide the access needed for demolition equipment to remove all structures to a minimum depth of approximately 3 feet below existing grade.

2.3.3 Containment Building Decontamination and Dismantlement

The SONGS Units 2 and 3 Containment Buildings (domes) are the most prominent structures on the Onshore Site, with a top elevation of 191 feet MLLW at the dome top and a bottom elevation at the floor area of the reactor of about -5 feet MLLW. The surrounding local grade is at about 30 feet MLLW. After SNF is transferred from wet storage to the Approved ISFSI, the Containment Building reactor vessels and other plant components that were exposed to primary coolant water (e.g., steam generators, reactor coolant pumps, and piping) would contain most of the remaining radioactive material. The size, design details (e.g., pre-stressed concrete lined with carbon steel), and SSC content of the Containment Buildings require the decommissioning approaches discussed below.

2.3.3.1 Containment Access Opening

Removal of radioactive components and the reactor vessels from each Containment Building would likely begin by increasing the size of the building's access opening (e.g., by enlarging the existing equipment hatch[15] or creating a new opening). A larger opening would simplify rigging operations required to install disassembly equipment and remove large components. Likely steps to create a larger or new opening include: (1) de-tension and remove the Containment Building steel tendons; (2) cut the structures' inner steel liners using mechanical or thermal tools; and (3) use abrasive cutting or other mechanical equipment to remove sections of the Containment Building reinforced concrete walls.

[15] Enlarging the Containment Building openings has been performed previously during maintenance outages to support SONGS steam generator and reactor head replacement projects.

2.3.3.2 Reactor Vessel and Internals Removal

The reactor vessels are composed of three major assemblies (vessel head, vessel internals, and vessel shell) that would be handled separately for disposal. The portions of the reactor vessel internals that are very radioactive would be separated out for transfer to the Approved ISFSI pad for storage as GTCC waste. Additional security measures would be required until the GTCC waste is in the Approved ISFSI PA. Once the GTCC is removed, several options could be used to dispose of the remaining sections of the internals depending on their waste classification (Class A, B, or C waste).

- The most likely waste disposal method is to further segment the reactor vessel internals into smaller pieces and package them in canisters for transport on truck or train. Segmentation cuts would be engineered to allow for segregation by waste class, since Class B and C waste have different transport and disposal rules than lower-level Class A waste.
- A second approach would be similar to the first approach with additional cutting of each section of the reactor vessel and the corresponding sections of the reactor vessel internals into smaller sizes before final shipping as one package.
- All or some of the remaining reactor vessel internal components could also be returned to the inside of the reactor vessel. Grout would be added inside to prevent moving of pieces during shipping, and openings would be covered with metal plates. The assemblage of these parts would be shipped as one package.

To prepare for this work, both units' reactor refueling cavities would be filled with about 1 million gallons of water (see Section 2.3.10~~3~~, *Water Use and Power Supply*). The reactor vessel internals would be sectioned underwater using remote cutting tools controlled by operators with cameras. Workers using long handle tools from bridges would retrieve, measure dose rates, weigh, and place each piece into underwater containers or into temporary staging areas. The measured dose rate and weight for each piece are used to confirm its waste classification. At times, loaded containers may accumulate on-site while awaiting transport off-site. Additional security measures and temporary shielding may be needed depending on how much radioactive material is in the staging area.

2.3.3.3 Reactor Vessel Head Removal

The reactor vessel head is a large component that is attached to the reactor vessel. The reactor vessel head was routinely removed during refueling operations to access the inside of the reactor vessel. To facilitate disposal of the heads, components mounted on top of the heads would be removed using mechanical or thermal cutting processes. This may be done near the reactor vessel or in another area inside the Containment Building. The heads would likely be cut into two or more pieces for convenient packaging and shipping as Class A waste to a licensed disposal facility. Because of the relatively low dose, all cutting can be done dry (out of water).

Cutting of the reactor vessel heads for shipment is not always necessary. For example, the original SONGS Unit 2 reactor vessel head was shipped off-site in one piece, after removing the components mounted on top. The reactor vessel head was replaced to address concerns related to the use of iron-nickel-chrome alloy for critical parts of the reactor coolant system, which had proven to result in premature aging in the high temperature environment of the reactor coolant system (SCE 2016a – DR #1-7). The Unit 2 and 3 reactor vessel heads were scheduled for replacement in successive refueling outages; however, SONGS was permanently retired prior to the planned Unit 3 outage and therefore only the Unit 2 reactor vessel head was replaced.

2.3.3.4 Reactor Vessel Shell Removal

The reactor vessel shell is a large cylindrical alloy steel vessel with a bottom hemispherical head. The vessel is about 15 feet in diameter with a wall thickness up to 9 inches. The reactor vessel shell would likely be sized for shipping by cutting the vessel into multiple pieces using either mechanical or thermal cutting processes. Surfaces of the cut vessel sections would be sealed and then the cut sections would be packaged for shipment to a licensed disposal facility. Alternatively, the reactor vessel could be shipped as one package, as described above under Reactor Vessel Internals.

2.3.3.5 Removal of Steam Generator, Pressurizer, Reactor Coolant System Piping, and Other Components

Each Containment Building at SONGS contains two steam generators that weigh about 640 tons each. Structural supports and attached piping would likely be removed from each steam generator using disassembly methods such as mechanical and thermal cutting to reduce personnel radiation exposure. The steam generators would then likely be cut into two or more pieces sized for easier handling and shipping. Segmentation into smaller pieces would likely be performed inside the Containment Buildings. Before shipping each piece, cover plates would be installed over all openings, then a protective (lockdown) coating would be applied to affix any possible surface contamination before the pieces are removed from the Containment Buildings. The pieces would be shipped as LLRW to a licensed disposal facility.

Each Containment Building also contains a pressurizer (a 37-foot-long, 9-foot-diameter cylindrical vessel with domed heads on both ends) made of carbon steel with a stainless-steel lining to avoid rusting. Structural supports and piping would likely be disassembled using mechanical or thermal cutting methods. The pressurizer would then likely be removed from the Containment Building in one piece or cut into smaller pieces, if needed, to fit into standard size railcars or boxes, and shipped by truck or rail. Reactor coolant system piping is large diameter (30 to 42 inches) piping, which would likely be cut into small pieces for shipment using either mechanical or thermal cutting equipment. The pipe sections would be packaged (openings sealed or a fixative applied) then shipped as LLRW to a licensed disposal facility. Other contaminated components, such as reactor

coolant pumps, valves, and small diameter piping, would be removed with mechanical or thermal cutting equipment, then sealed for shipment or loaded into standard low-activity waste shipping containers for shipment and disposal. Items may be placed in containers or painted with a lockdown paint used to fix and retain contamination to the surface.

2.3.3.6 Containment External Shell Removal

The external shell of each Containment Building consists of a steel-reinforced concrete cylindrical wall with a hemispherical dome. Steel post-tensioning "tendons" (similar to wire cables) are located within the reinforced concrete wall and dome. The tendons are installed in sheathing, which forms ducts through the concrete between anchoring points, with the space between the sheathing and tendon filled with a petroleum-based material for corrosion protection. The post-tensioning cables can be removed before, during, or after building demolition. Before demolition of the external wall and dome, any SSCs and necessary interior walls would have been removed. Steel liners would be removed during the demolition process as the structure is demolished.

The external wall and dome pieces may be free of contamination or have small amounts of internal contamination. Even if the external wall and dome pieces are clean, the DGC may elect to treat them as if contaminated or ship them as radioactive waste. Decontamination efforts may also occur. The containment external wall and dome would be dismantled using two possible approaches. Mechanical tooling may be used to cut the shell into blocks. These blocks would be sized to allow a crane to lift and move these pieces effectively. The crane used (a track style crane or tower crane) would be outside of the Containment Building dome. Once at ground level, the blocks could be further reduced in size or loaded onto railcars or trucks. These blocks would be shipped as clean or radioactive waste depending on whether they are contaminated or not.

Because of the height (approximately 160 feet above existing local grade) and concrete thickness of the containment external shell, there are limited choices for demolition equipment. A combination of abrasive wire saw and large hydraulic (jack) hammer attached to an excavator is the likely approach. The wire saw would cut the external shell into blocks that are removed until the remaining structure is at a low enough elevation to where a jack hammer can break up the lower portions of the structure. Debris generated by the jack hammer would fall to the ground, accumulate, then be retrieved. The wire sawed blocks can be further reduced in size before shipping off-site.

Another approach would use a large excavator with hydraulic rams or similar attachments all around the outside of the structures near ground level to evenly chip away at the wall. This continues to a design point where a vertical area (for instance, ground level up to 4 feet) around the dome is a thin wall. Then, with the operator at a safe distance away, final jack hammering weakens the wall so that small sections collapse in a controlled manner and evenly drop the structure down the approximate distance of the thin wall section (in

this case, a 4-foot drop). Debris is removed and disposed of, and the operation resumes. Once low enough, the top of the dome is demolished using long reach jack hammers.

2.3.4 Other Structures, Systems, and Components Removal Methods

In addition to the typical removal methods described for SSCs, the following SSCs have unique qualities that may influence the D&D approach used for their removal.

2.3.4.1 Fuel Handling Buildings/Spent Fuel Pools

Two Fuel Handling Buildings, each containing a steel-lined spent fuel pool (one for each Unit) that stores SNF that is being transferred to the Approved ISFSI, are located adjacent to the Containment Buildings. They include below-grade structures, and their lowest floor level is at 15 feet MLLW (local grade is at 30 feet MLLW). Since the spent fuel pools are no longer required, the SSCs would be prepared for demolition. Prior to beginning structure demolition, highly-contaminated SSCs would be surgically removed. Remaining walls, floors, and the roof would be decontaminated to meet open-air demolition criteria. The above-grade structure would likely be demolished using a large excavator with hydraulic rams or processing shears. Tunnels (e.g., the electrical cable tunnel at approximately 17 feet MLLW) would be decontaminated to permissible levels to meet ~~Final Status Survey~~FSS requirements and would be collapsed and backfilled, or opened from the top and backfilled, or backfilled with concrete slurry.

The spent fuel pools would be prepared for demolition by removing the SNF storage racks. Racks are typically removed in modules, lifted out of the water to a work area, cut to a smaller size if desired, wrapped to contain any contamination, loaded on a truck or rail car, then likely shipped as radioactive waste (decontamination is not considered practical because of the racks' complex geometry and widespread contamination). Spent fuel pool water would be processed as discussed in Section 2.2.3.8, *Water Processing*. Once the spent fuel pools are drained, the stainless-steel pool liner would be removed by mechanical or thermal cutting. These steel plates would be disposed of as radioactive waste. The remaining concrete wall is anticipated to be largely free of contamination. If contamination is found, that area would be decontaminated or removed. The remaining SSCs in the spent fuel pools include heat exchangers, piping, and cranes, which would likely be removed and disposed of as radioactive material.

2.3.4.2 Auxiliary Building Area

The ABA includes a Radwaste Area, Control Area, and Penetration Areas (see Table 2-2). Each area would be decommissioned as described below.

- **Radwaste Area.** The Auxiliary Building Radwaste Area has five floors below the roof. The tallest part of the Radwaste Area side of the structure is at approximately 99 feet MLLW and the lowest floor is at 9 feet MLLW. All systems (e.g., fire protection, gas, water, and waste lines) would be isolated and drained before

demolition. All or some of the contaminated building areas and SSCs may be demolished without decontamination, provided open-air demolition levels are achieved by means such as affixing the removable surface contamination with adhesives or paints. If decontamination is selected, loose items and attached components may be removed. Piping, conduits, and duct work would be cut free. Some large tanks may need surrounding walls removed to allow access. Hazardous wastes would be separated and disposed of via approved waste streams. Once the SSCs are removed as needed to meet decontamination criteria, the remaining structure would be evaluated for residual contamination, with decontamination as required or removal and disposal of certain areas via a contaminated waste stream.

- **Control Area.** The Auxiliary Building Control Area (containing the Control Room, electronics, computers, etc.) is radiologically clean. However, the large amount of wiring and instrumentation would be evaluated for hazardous characteristics and universal waste and would be properly removed. The control side of the Auxiliary Building has four floors plus items on the roof. The tallest part of the structure is about 105 feet MLLW; the lowest floor top surface is at 9 feet MLLW. Selected interior items would be pulled, unbolted, or cut out and separated for disposal via approved waste streams. Once hazardous and universal waste streams and the necessary SSCs are removed, the remaining structure would be re-evaluated for any contamination. If appropriate, decontamination can be done in some areas.
- **Penetration Areas.** SONGS Units 2 and 3 each contain a Penetration Area. The lowest floor of the building is at 9 feet MLLW (except for a small area at 0 feet MLLW, accessed by ladder) with a roof at approximately 95 feet MLLW, and ventilation equipment and jib cranes located above this height. Some areas are radiologically contaminated. Prior to demolition, physical connections to the Containment Buildings would be severed, and cables and pipes removed, as necessary. Site characterization would identify known radiological and other hazardous waste and universal waste to be properly removed prior to demolition.

At this point, the Radwaste, Control, and Penetration Areas of the Auxiliary Building would be in the same condition, and D&D of the whole Auxiliary Building can begin. Various forms of contamination may remain within the structure. Some or all the interior walls, ceilings, and floors can be removed. Interior wall removal is likely necessary to complete the final removal of storage tanks, pipes, and other hard-to-reach SSCs.

Some areas inside the Auxiliary Building are radioactively contaminated. Controls would be established before a wall, ceiling, door, or floor is breached to any areas that may contain residual hazards. When a radiologically contaminated area is demolished, it would be isolated as an RCA, with entry into the area controlled in accordance with NRC and other regulatory requirements. Demolition and all other equipment used in this area would be designed for RCA use only and would be evaluated for residual contamination

and cleared before being moved outside the area. A contaminated structure demolition may require a temporary structure to control and monitor contamination.

~~Areas where loose contamination or debris have fallen would be temporarily covered with a layer of soil or concrete rubble. The area where contaminated debris falls would be surveyed for residual contamination and remediated after completion of structure demolition.~~ To prevent any airborne movement of contamination from leaving the area, appropriate controls would be in place. The contamination may be locked down or covered so it cannot go airborne. The area where the contaminated debris falls would be protected by appropriate barriers, such as containment tents, truck tarps, geotextile fabric, visqueen, extra layers of soil cover, or other similar controls, to prevent any loose contamination or small pieces of debris from entering the ground. Any material that falls on the ground, along with the surrounding layer of soil, would be removed and tested in accordance with FSS criteria. If material and soil test below the FSS radiological and non-radiological thresholds, it is acceptable for site backfill. If material and soil test above the FSS thresholds, it would be shipped offsite to a Class A radiological waste facility. (SCE 2018n).

Additionally, dust suppression controls would be utilized to prevent debris from becoming airborne when moving material to stockpiles and loading material into containers. Methods could include wetting the materials prior to movement and covering stockpiled materials. Other contamination controls could include, but are not limited to, applying a fixative to the material prior to movement, or storing material in a tented area under negative air pressure. Periodic contamination surveys of stockpiled material would be performed to confirm the effectiveness of controls and containment. (SCE 2018n)

Typically, demolition starts from the top down. Soil around exterior walls would be excavated to a depth needed to allow demolition from the top of the wall down to the desired elevation. Any contaminated soil would be removed and disposed of via an approved waste stream. As large pieces of the upper sections begin to collect on the ground, they would be moved to processing areas where steel rebar or other items can be separated from the concrete. A portable concrete crusher (permitted by the local air quality management district or California Air Resources Board, as required), would crush the concrete and any embedded items would be removed. Concrete crushing would occur at an average rate of 1,500 tons per 8-hour day for an estimated 170 days (SCE 2017b). Larger concrete blocks would be broken into manageable pieces. In rubble form, the concrete can be packaged and shipped in truck or railcar more efficiently. Because demolishing and crushing concrete generate dust, water would be used to minimize fugitive dust emissions (see Section 2.3.1~~3~~0, *Water Use and Power Supply*).

2.3.4.3 Turbine Buildings

The Turbine Buildings are open-air buildings located on the west side of the Onshore Site and are some of the largest onshore structures. The bottom floors of the Turbine Buildings

are at elevation 7 feet MLLW, with an intermediate floor elevation of 46 feet MLLW, and a roof deck elevation of 72.5 feet MLLW; the bottom floor of the Full Flow Condensate Polishing Demineralizer area is at elevation 30.5 feet MLLW (SCE 2016a – DR #1-9). The Gantry Crane is associated with the Turbine Building and has a top elevation of approximately 128 feet MLLW. The Gantry Crane trolley rides on rails along the top of the Gantry Crane structure. The roof of the Gantry Crane trolley is at an elevation of 137.5 feet MLLW. Prior to demolition of the Turbine Buildings, the Gantry Crane would be used to remove the large components located within and on the decks of these buildings. The buildings house heaters, pumps, fans, condenser water boxes, and electrical load centers that are removable through hatch openings in the decks. The crane would also be used to remove the turbine casings and rotors and the generator (SCE 2016a – DR #1-10).

The Turbine Buildings would be dismantled primarily by unbolting, cutting, or use of mechanical shears. Implosion (placing explosive material and timing the detonation so that the structure collapses on itself) would not be used (SCE 2017b). To gain access to the lower SSCs, access may need to be created or enlarged in the floors and walls. Once the building has been gutted of large components for which the Gantry Crane is required, the Gantry Crane would be demolished. After large items are removed, remaining items that have a potential for contamination would be removed, if accessible. Non-accessible items would be identified and removed in a controlled manner after the structure is demolished. Penetrations and piping leaving the buildings would be surveyed for contamination. Some may be cut free from the building structure and capped at this time or done later. The Turbine Buildings also include key SSCs that do not require unique D&D methods: Turbines/Generators/Exciters; Reheaters; Lubricating Oil Heaters; Feedwater Pumps; Piping; Gantry Crane; and Tunnels.

2.3.4.4 Intake Structure Area

The ISA is located within the Onshore Site at the Units 2 and 3 seawall and connects to the offshore conduits. This area is anticipated to be free of contamination and all SSCs in this area would be removed in accordance with methods described in Section 2.3.2, *Decontamination and Dismantlement*. Mechanical/thermal cutting methods would remove SSCs, which include water pumps, traveling water and bar screens, sluice and main stop gates, piping, and jib cranes. Large pieces of concrete and steel would also be removed.

2.3.4.5 Unit 1 Reactor Vessel

The SONGS Unit 1 reactor vessel package is in a shielded container stored in the northeast corner of the NIA. The preferred option for the Unit 1 reactor vessel is one-piece shipment in its current package to a disposal facility. However, if size or weight limitations preclude one-piece shipment, the reactor vessel would be cut into pieces prior to shipment. Before cutting, the package would be set up as a temporary RCA, with appropriate controls. Cutting debris would be confined to a small area using localized barriers (e.g., plastic drop cloths). After cutting, the openings would be covered and

sealed with steel plates. Removal of the SONGS Unit 1 reactor vessel package from the site would be done by the DGC in parallel with other D&D activities.

2.3.5 Removal of Other Infrastructure

2.3.5.1 Retaining Wall between Units 2/3 and North Industrial Area

The ~~short (less than 5-foot-tall)~~10-foot-tall retaining wall between the NIA and SONGS Units 2 and 3 would be removed and disposed of as any other non-contaminated SSC. The area where the retaining wall was located would be stabilized by creating a 2:1 slope. All erosion controls and BMPs would be implemented and maintained in accordance with the requirements of the SWPPP (SCE 2018g).

2.3.5.2 Utilities

The SONGS Proposed Project area contains utility poles, guardrails, fire hydrants, piping, electrical conduits, vaults, tanks, sanitary sewer lines, and other SSCs that are not located in a building. These SSCs, including any added to support D&D work, would be removed as required, except those needed for the Approved ISFSI and switchyard. Prior to demolition, sanitary sewer lines would be flushed with clean water to the main sewer line. After flushing is completed, the line would be isolated at the main line outside the building and all openings to the sanitary sewer in the building would be plugged with a watertight seal to prevent accidental releases to the sanitary sewer system. Above-grade SSCs would be removed by methods described in Section 2.3.2.1, *General Approach to System and Component Removal*, and Section 2.3.2.3, *General Approach to Structure Demolition*. Below-grade or transitioning-below-grade SSCs would be removed as required to achieve NRC unrestricted release criteria[16], to perform a ~~Final Status Survey~~FSS on the SSC, or to avoid leaving a void space that would be created if the SSC was abandoned in place.

2.3.5.3 Parking Lots, Access Roads, and Railroad Tracks

Some parking lots and access roads may be needed for the Approved ISFSI and switchyard operation and maintenance, and Future Activities. This could include Parking Lots 1, 2, 3, and 4, and access roads to the SYA and NIA areas. Access roads and parking lots that are no longer needed would be demolished during the Proposed Project. These SSCs are primarily composed of concrete or asphalt. Construction equipment would be used to remove the material and reduce the size of the waste material for efficient packaging. Waste would be segregated and re-used or disposed of at an approved

[16] The NRC unrestricted use release limit is 25 milirem per year (mrem/yr). The SONGS Participants have contracted for a post-Proposed Project residual release criteria of 15 mrem/yr. In 2015, the DoN directed SCE to show that the Mesa lease parcels 5, 6, and 7, which contained support facilities located east of Interstate 5, would achieve a release criteria of no more than 12 mrem/yr. As the landowner, the DoN may ultimately require decontamination to a lower threshold than what is required under NRC regulations. (SCE 2018j – DR#7-7)

disposal facility. After removal, backfill material may be required to obtain a level grade and ensure appropriate sloping for stormwater drainage.

Railroad tracks would be inspected, evaluated for use, and remain in place or expanded if needed to support Approved ISFSI operations, ship SNF off-site, and support Future Activities. If determined to be of benefit for decommissioning, they would be removed during Future Activities. An excavator or other large construction equipment would remove all unneeded railroad tracks in the PA and asphalt or concrete located under or near the rails.

2.3.6 Offshore Conduit Disposition and Related CSLC Lease Offshore Activities

SONGS Units 2 and 3 used seawater pumped through intake conduits and discharged through discharge conduits to remove waste heat generated during the thermal cycle during plant operations. This "once-through cooling" ended when SONGS shut down; cooling in the Spent Fuel Pool Island (SFPI) system (approved under CCC CDP No. 9-15-0162; CCC 2015c) does not require cooling with ocean water; however, a significantly reduced intake of water is still used for waste dilution per the facility's NPDES permit. In January 2018, the average Unit 2 intake was 9.91 million gallons per day (MGD) and the average for Unit 3 was 11.43 MGD (SCE-AM 2018d). The conduits are constructed of 18-foot-inner-diameter steel-reinforced concrete pipe buried below the seafloor and covered with an estimated 3 to 4 feet of sand/gravel backfill and 2 feet of accumulated sediment.[17] As shown in Figure 1-2 in Section 1.0, *Introduction*, each intake conduit is about 0.63 mile (3,300 feet) long measured from the onshore seawall to the Primary Offshore Intake Structure (POIS) situated at the seaward end of each conduit; the discharge conduits are about 1.6 miles (8,400 feet) and 1.1 miles (6,000 feet) long, respectively. The conduits for each unit are spaced 40 feet apart on center. As they extend seaward from the seawall, the Units 2 and 3 conduit pairs diverge from each other to a point about 0.47 mile (2,500 feet) from the seawall where they run in parallel. For the parallel portion of the conduit pairs, the two intake conduits are about 634 feet apart from each other, measured from the conduit centerline, and the two discharge conduits are about 714 feet apart, measured from conduit centerline. Specific components of the offshore conduits are described in more detail below. The Applicant would abandon these conduits in place, after removing vertical structures on the conduits as discussed below.

2.3.6.1 Offshore Intake System

Seawater is drawn into the intake conduits at their respective POISs by onshore pumps and directed to the onshore plant systems. Each POIS structure, which connects to the

[17] This EIR assumes an even 6-foot coverage over the conduits based on a 2-foot sediment layer, plus a 3- to 4-foot sand/gravel backfill layer. (A November 2010 visual inspection of the Unit 3 primary offshore intake structure indicated a 2- to 3.5-foot range in depth of accumulated material [SCE 2016c]. A prior engineering study (Gerwick 2003) for the Unit 1 intake/discharge conduits contains a conduit profile that illustrates a trend of sedimentation, as opposed to erosion or scouring [SCE 2016c]).

18-foot-inner-diameter intake conduit, is comprised of a reinforced concrete riser measuring 32 feet in diameter and extending approximately 18 feet above the seafloor, in a water depth of approximately 30 feet. Most of the riser is buried below the seafloor and is constructed on a 4- and 6-foot-thick, 49-foot-diameter reinforced concrete footing for Units 2 and 3, respectively. A velocity cap, 49 feet in diameter with a 7-foot-wide opening, is attached to the top of each POIS to control the rate and direction of flow entering the system (Figure 2-7). The velocity cap minimizes the entrainment of fish into the intake system by converting the vertical water flow to a lateral flow, thus triggering a flight response from the fish. Backfill consisting of crushed stone or river-run aggregate begins at the top of each POIS footing and extends 1 to 2 feet above the top of the intake conduits. The backfill is covered by a 3-foot-thick (minimum thickness) stone blanket, composed of 50 percent by weight of 300- to 600-pound angular quarry rock. The stone blanket extends to a minimum of 30 feet radially around the edge of each POIS riser. The top of the stone blanket is positioned at the depth of the seafloor.

An auxiliary offshore intake structure (AOIS) is connected to each intake conduit approximately 92 feet landward from the center of each POIS. The AOIS provided sufficient cooling capacity if the respective POIS was inoperable or one unit's conduit was out of service. Each AOIS is made of reinforced concrete, measures approximately 5.5 feet in diameter, and rises approximately 10 feet above the seafloor (Figure 2-8). A 9.5-foot-diameter cap is attached to the top of each AOIS. Around its base, a 3-foot-thick stone blanket extends a minimum of 10 feet from the wall of each AOIS riser. SCE also installed ~~four~~ two large organism exclusion devices (LOEDs) at the POIS and the AOIS. The LOED consists of a Dyneema® net fitted over the top and around the circumference of each POIS and AOIS. Removal of the LOEDs would occur during ~~conduit dispositioning~~ CSLC Lease Offshore Activities.

Three manhole access port structures (MAPS) provide access to each intake conduit for maintenance. Figures 2-9 and 2-10 show typical MAPS configurations. Each MAPS extends vertically about 10 feet from its associated conduit. Backfill around each MAPS is comprised of the 4-foot-thick cover over the conduits plus an assumed 2 feet of accumulated sediment (an estimated 6 feet of total cover material around each MAPS base). Based on this information, each MAPS extends approximately 4 feet above the current seafloor on average. Refer to Section 2.3.6.4, *Offshore Dispositioning Approach*, for details on the dispositioning approach for the offshore intake system.

2.3.6.2 Offshore Discharge System and Proposed Project Discharges

At this time (~~2018~~ 2019), the Unit 2 discharge conduit is used to discharge treated sanitary wastewater, sewage treatment plant effluent, and stormwater runoff that requires dilution at a 10:1 ratio (SCE 2017c), and the Unit 3 discharge conduit is not in service (SCE 2016a – DR #1-16). Existing discharge volumes through the Unit 2 conduit are approximately 21.37 MGD (about 30 MGD below SCE's existing NPDES permit [SCE-AM 2018d]).

Discharges through Unit 2 consistent with existing levels in compliance with permit allowances would continue during the Proposed Project (SCE 2017c). New discharges would include treated water from the spent fuel pools, and water used for reactor vessel segmentation (see Section 2.2.3.8, *Water Processing*). If D&D work near the onshore intake structure requires dewatering of structures, dewatered effluent would also be treated and discharged (see Section 2.4.1, *Additional Onshore Substructure Removal*).

The conduits are designed to release water through 63 reinforced concrete diffuser ports mounted on top of each conduit at approximate 40-foot intervals from the seaward end. Each diffuser port is about 12.5 feet high, 8.5 feet long, and 6 feet wide (Figure 2-11) and contains a 3-foot-diameter diffuser nozzle. A 3-foot-thick stone blanket surrounds the base of each diffuser, extending approximately 10 feet from each side. The diffuser section on the end of the Unit 2 discharge conduit extends from approximately 1.1 to 1.6 miles (5,900 to 8,400 feet) offshore, measured from the seawall. The Unit 3 discharge conduit diffuser section extends from approximately 0.68 to 1.1 miles (3,600 to 6,000 feet) offshore. Water depths at the diffuser ends are approximately 30 to 50 feet.

The Units 2 and 3 discharge conduits contain nine and eight MAPS, respectively (There is a total of 23 MAPS for all conduits [including the 3 on each intake conduit]). MAPS located shoreward of the intake conduits' POIS have an assumed 2 feet of accumulated sediment around their base. MAPS located seaward of the intake conduits' POIS have a 3-foot-thick stone blanket around their base plus the assumed 2 feet of accumulated sediment. Refer to Section 2.3.6.4, *Offshore Dispositioning Approach*, for details on the dispositioning approach for these offshore structures.

2.3.6.3 Fish Return System Conduit

During SONGS operations, a fish collection and handling system returned fish entrained in the seawater intake to the ocean. The system includes an 1,830-foot-long, 4-foot-diameter steel-reinforced concrete conduit (one conduit served Units 2 and 3), placed in the same trench as the Unit 2 intake conduit, with a 20-degree-angle opening above the seafloor (Figure 2-12). A roughly 30-foot-long, 12-foot-wide, 4-foot-thick stone blanket surrounds the end of this conduit. Because intake volume is reduced by at least 96 percent of original operational flows, fish can swim freely in and out of the primary and auxiliary intake structures and conduits without the risk of being drawn into the plant. SCE monitors the fish elevators daily as a precautionary measure. No observations of fish or other marine life (i.e., seals, sea lions, turtles) in the fish elevators have been recorded since August 2013 (SCE 2016a – DR #1-17). For details on the dispositioning approach for the fish return system conduit, see Section 2.3.6.4, *Offshore Dispositioning Approach.*

Figure 2-7. Primary Offshore Intake Structure

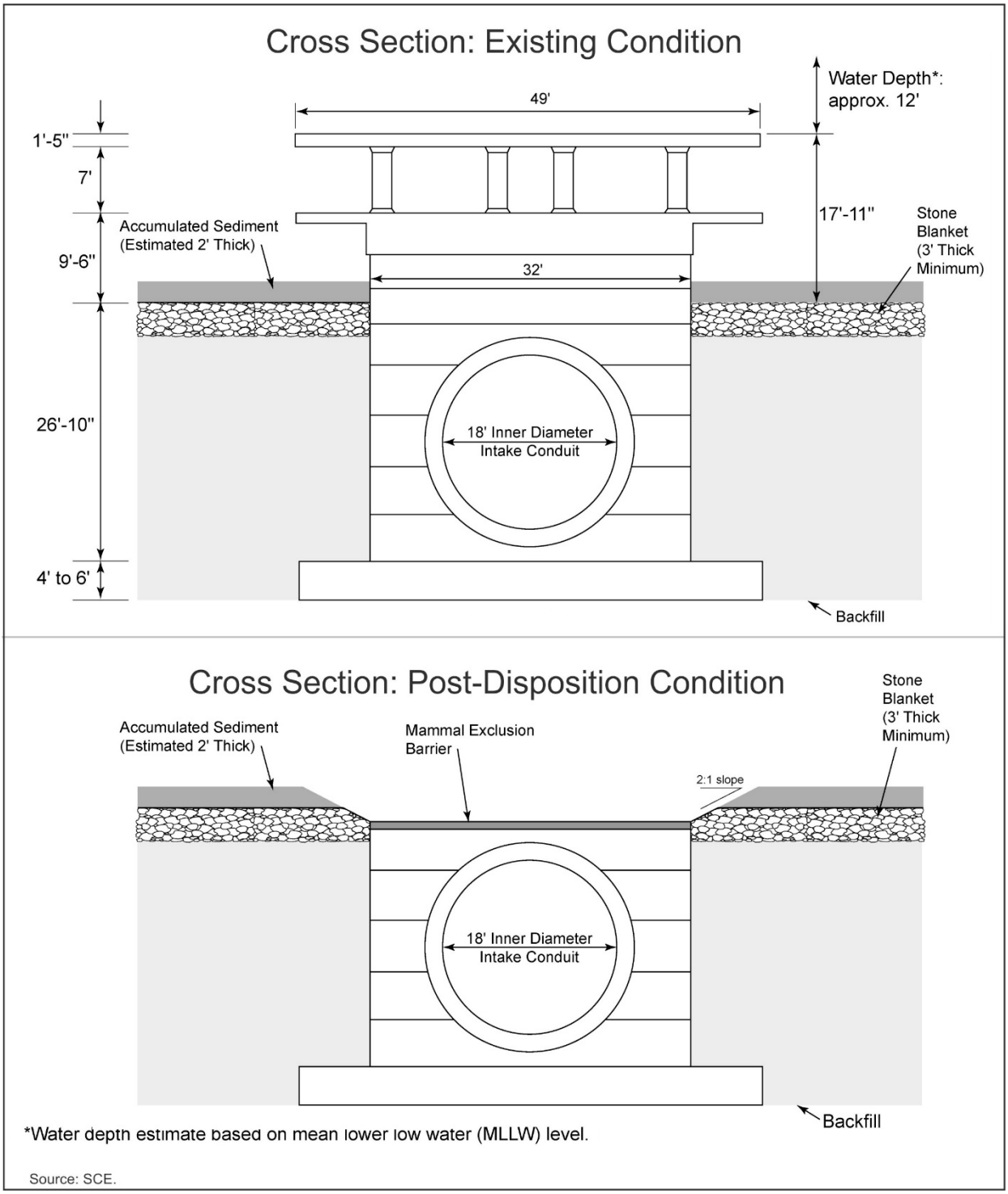


Figure 2-8. Auxiliary Offshore Intake Structure

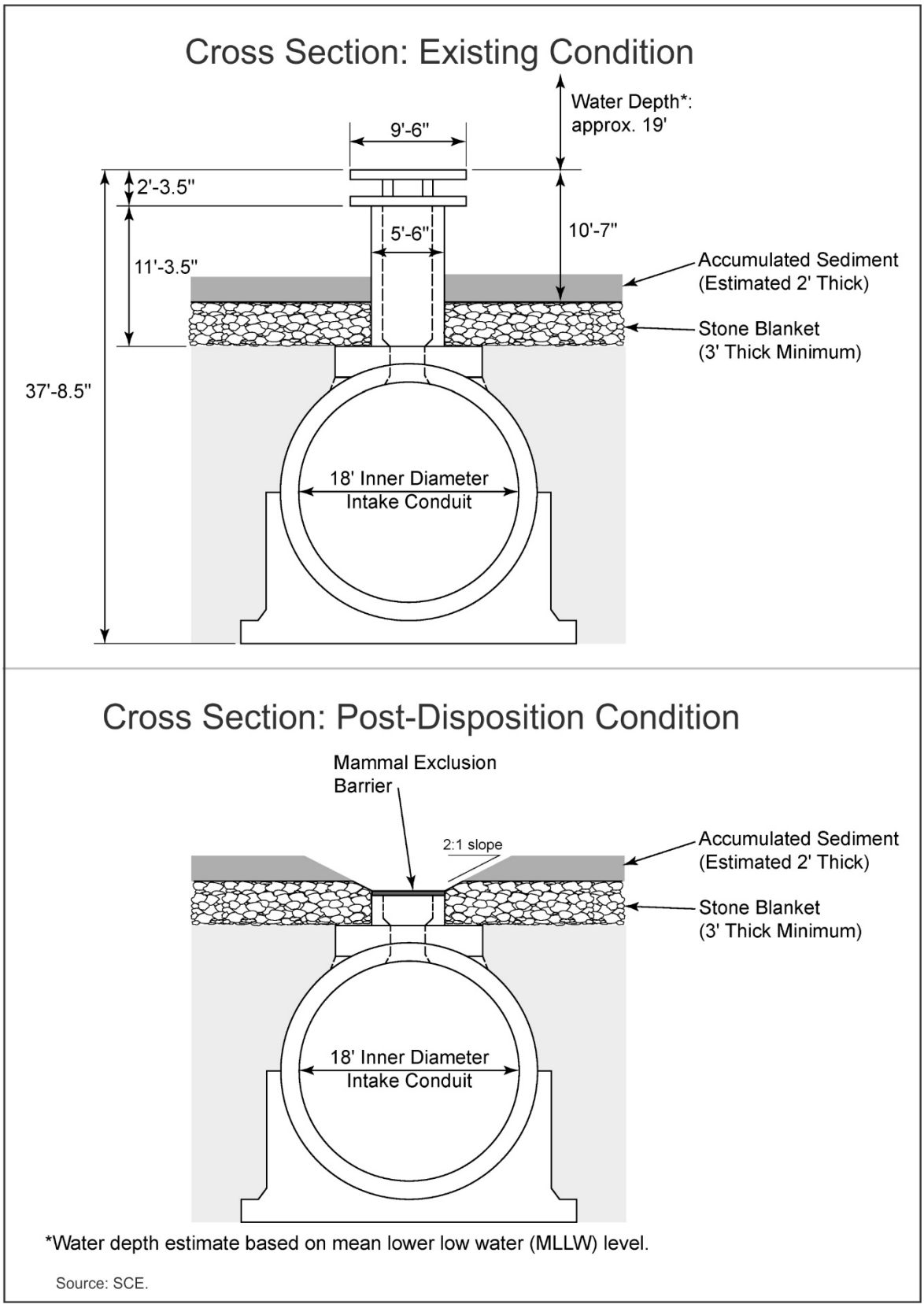


Figure 2-9. Manhole Access Port Structure

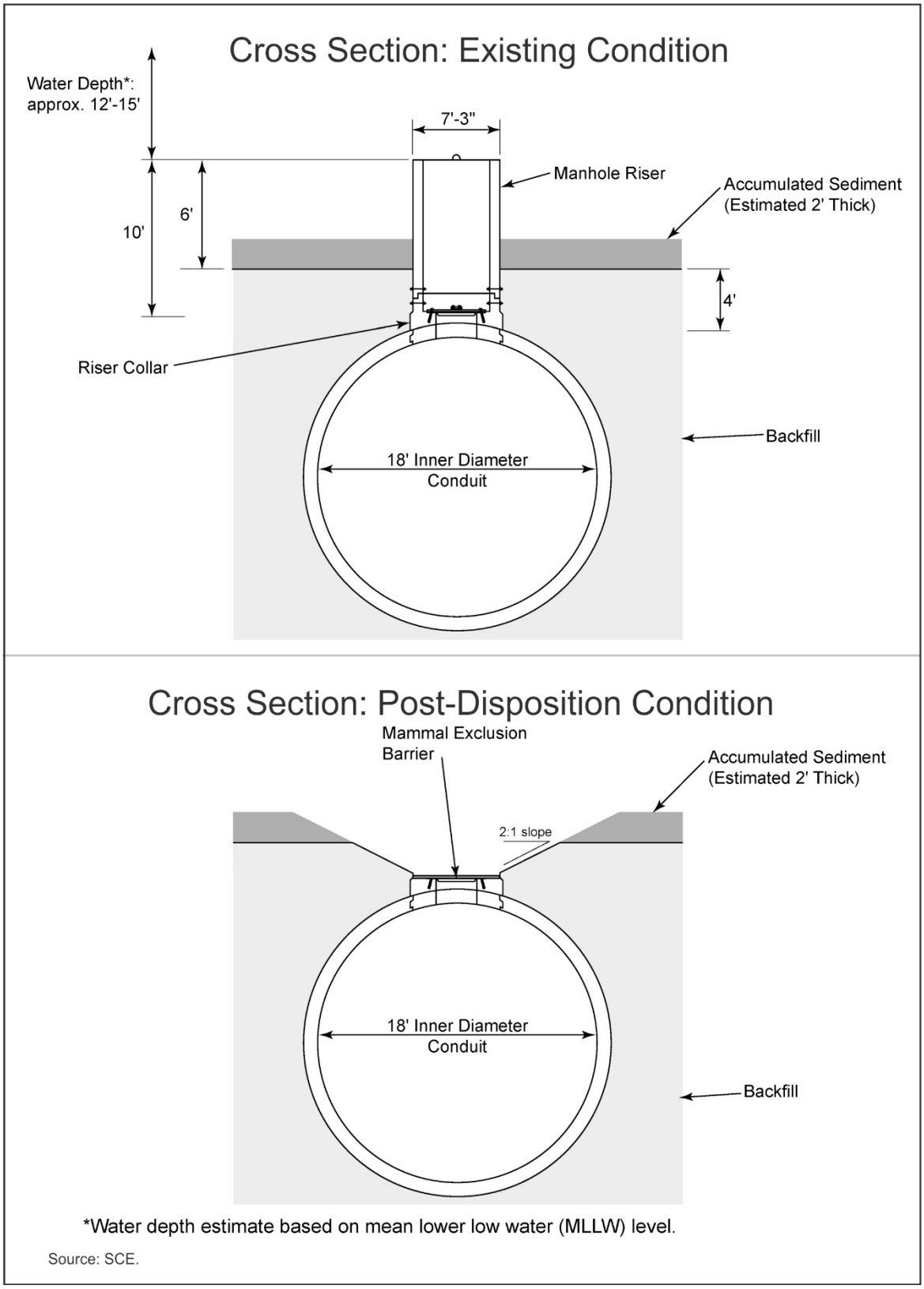
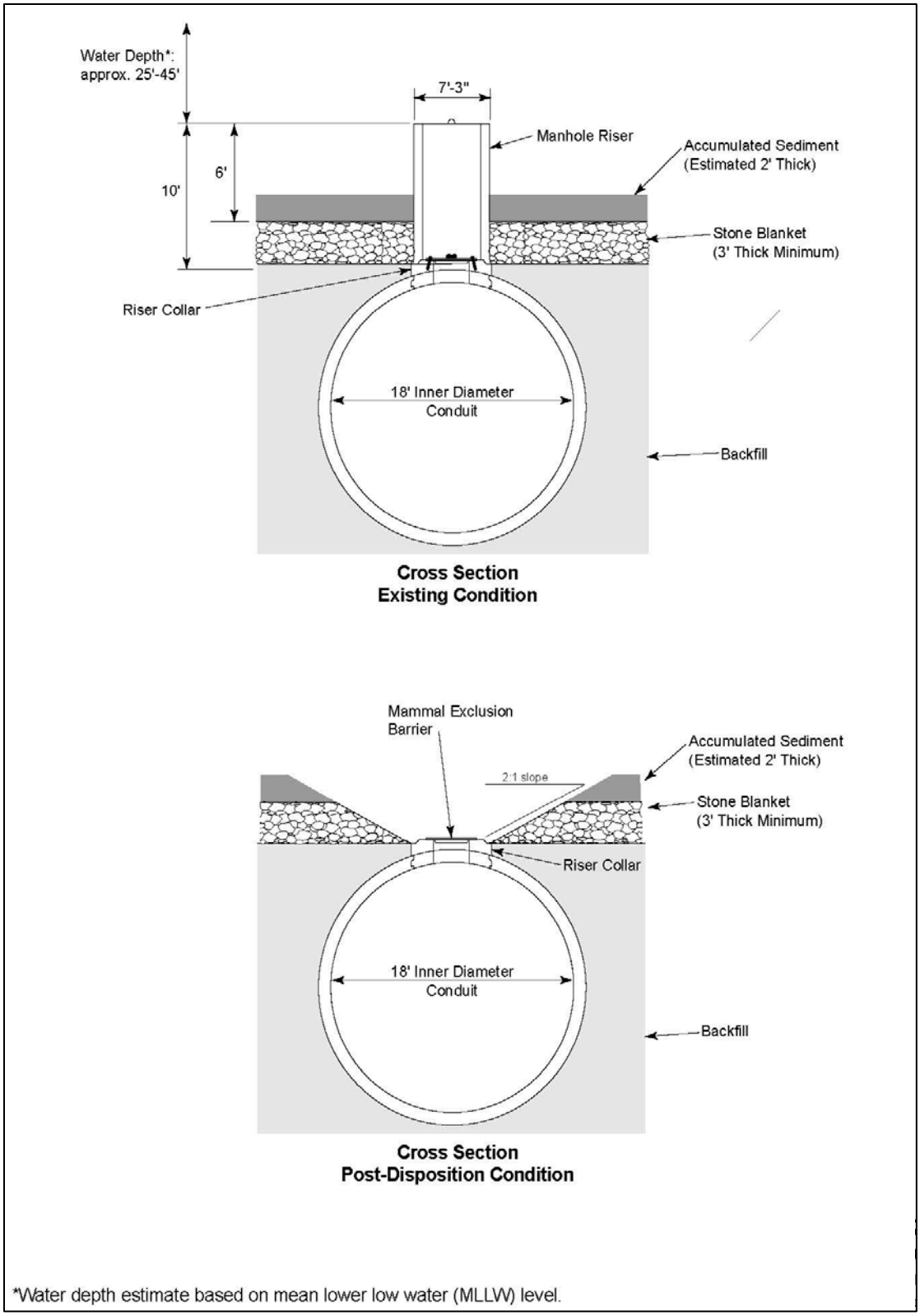


Figure 2-10. Manhole Access Port Structure with Stone Blanket (REVISED)



Source: SCE-HN 2019

Figure 2-11. Discharge Diffuser Port Structure

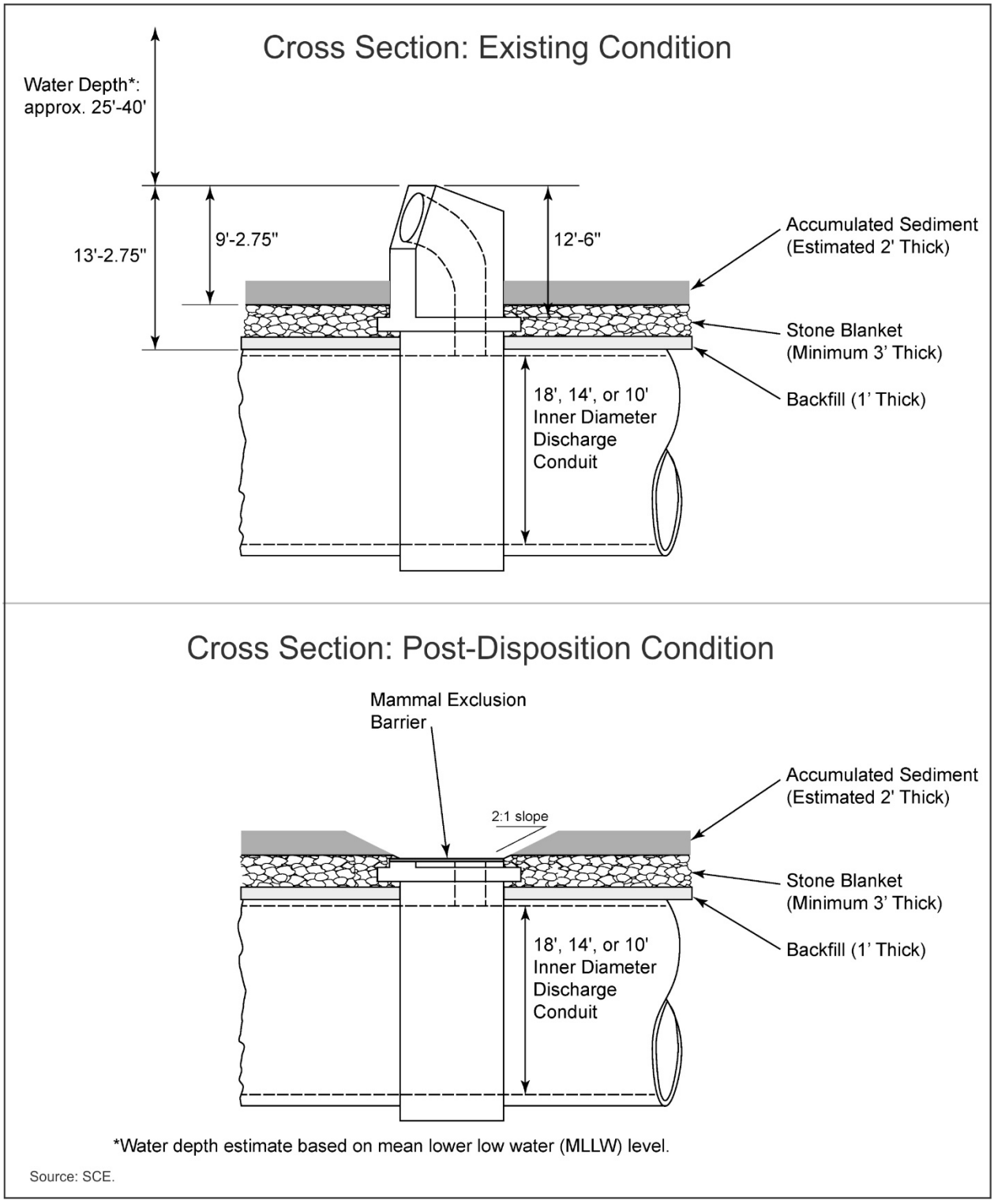
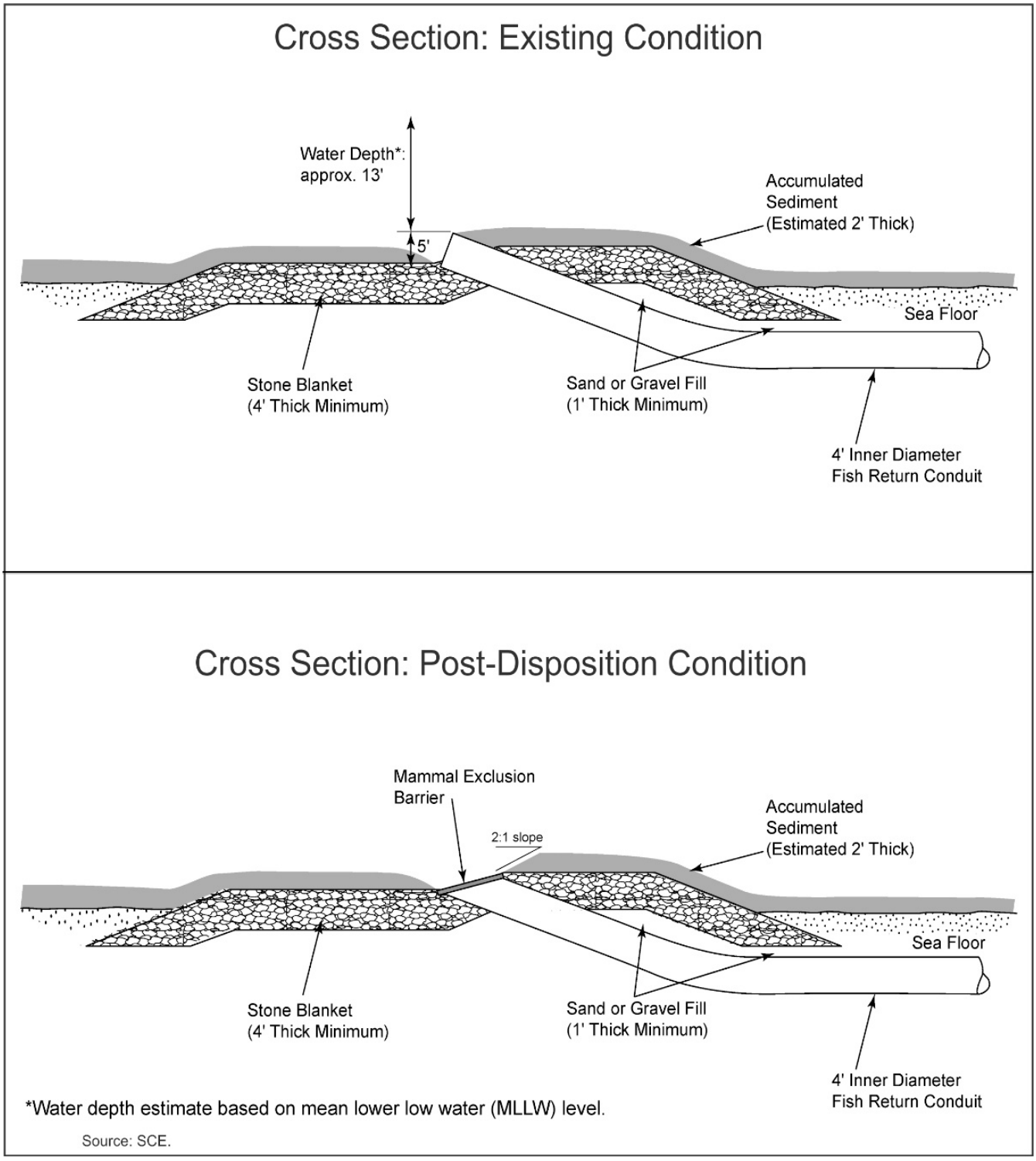


Figure 2-12. Fish Return Conduit



2.3.6.4 Offshore Dispositioning Approach

The Proposed Project includes abandoning in place the Units 2 and 3 horizontal intake and discharge conduits and fish return conduit beneath the seafloor and a box culvert connected to the seawall. Offshore Site components proposed for removal include:

- 2 POIS structures – 1 each for Units 2 and 3 intake conduits
- 2 AOIS structures – 1 each for Units 2 and 3 intake conduits
- 12 diffuser port structures – 6 each for Units 2 and 3 discharge conduits
- 23 MAPS (intake & discharge) – 12 for Unit 2 and 11 for Unit 3
- 1 fish return conduit terminal end that rises above the seafloor
- 2 navigational and 3 environmental monitoring buoys and their attached water quality instruments and anchors[18]

As proposed, ~~intake and discharge conduit disposition~~ CSLC Lease Offshore Activities would involve the following steps: remove the vertical components on the intake conduits; remove six diffuser ports on each discharge conduit at an interval of approximately one every 500 feet (this interval corresponds to the removal spacing for the SONGS Unit 1 conduit vertical risers); install prefabricated “mammal exclusion barriers,” with openings to allow sand migration into the conduits, at locations where vertical structures are removed to preclude entry to these conduits by humans and large marine organisms; and place temporary solid covers on top of the mammal exclusion barriers on the Unit 2 discharge conduit to prevent sand/sediment intrusion, as this conduit may be needed for decommissioning-related discharges during Future Activities (the covers would be removed once the conduit is no longer needed for discharges). This proposed design would contribute to conduit stability by allowing sand/sediment to accumulate in a conical fashion up to the opening with void spaces remaining in the horizontal portion of the conduits; engineering reviews indicate that the horizontal conduits buried beneath the seafloor remain stable regardless of sand infiltration (SCE 2017c). Sand infiltration also provides a factor of safety against buoyancy, and provides some incremental benefit to conduit stability (SCE 2018j – DR#7-10). The diffuser ports do not present a navigational hazard given their height relative to water depth (SCE 2017c); however, the lease may require removal of all the diffuser ports by the end of Future Activities (see Section 1.2.2.1, *California State Lands Commission*, and Section 5.4.3, *Partial Removal of Offshore Conduits*).

The box culvert, if abandoned in place, is not expected to be exposed by future shoreline erosion. This large concrete structure extends from the onshore Intake Area to the seawall then seaward about 160 feet under the walkway, riprap, and beach, where it connects to the offshore conduits under the seabed. It has a top elevation of -6.5 feet MLLW and a bottom elevation of -31 feet MLLW (typical) and -34 feet MLLW (at its

[18] Three buoys are near the seaward end of the Units 2 and 3 intake conduits, with two additional buoys located farther to the south (see Figure 1-2 in Section 1.0, *Introduction*).

deepest point). As described in the Coastal Environments (2017b) analysis of coastal processes at SONGS, with the seawall in place, some passive erosion would be expected to occur in the shoreline area seaward of the seawall out to approximately 125 feet offshore between now and 2050; however, the beach equilibrium profile is expected to reemerge when the seawalls are removed. Even with some degree of passive erosion in the shoreline area, conservatively estimated in the analysis, the shoreline elevation out to approximately 160 feet seaward of the seawall would not approach the top elevation of the box culvert. The analysis illustrates that the modeled beach profile in 2050 is expected to range from approximately +1 foot MLLW to -0.5 feet MLLW in the shoreline area above the box culvert, above the top elevation of the culvert. ~~After seawall removal, the box culvert is expected to become more buried over time (SCE 2018g).~~ The analysis illustrates that after seawall removal, from years 2050 to 2100, the beach profile migrates higher, effectively burying the box culvert over time.

~~The approach to remove the vertical structures depends on the type of backfill present.~~ Stone blankets are installed around the bases of the Units 2 and 3 POIS, AOIS, and diffuser port structures; and the MAPS on the portions of the Units 2 and 3 discharge conduits situated seaward of the POIS structures. The top of the stone blankets is level with the seafloor, excluding the approximate 2-foot-thick layer of accumulated sediment assumed to be present. Dispositioning activities require dredging adjacent to each vertical conduit structure to remove the structures and install the mammal exclusion barriers. The specific removal approaches by structure type are described below, while Table 2-6 summarizes the estimated disturbance areas and dredge volumes.

Table 2-6. Estimated Disturbance Areas and Dredge Volumes

Structure	Removal Approach	Disturbance Area (acres)	Dredge Volume (cubic yards)
POIS	Remove ~~first structural joint below top of stone blanket, including LOED~~ LOED and risers to the bottom riser ring segment that corresponds to the top of conduit (Figure 2-7)	0.860	458
AOIS	Remove ~~first structural joint below top of stone blanket, including LOED~~ LOED and risers to the connecting joint (riser collar) on the conduit (Figure 2-8)	0.011	68
MAPS (with stone blanket)	Remove risers to the connecting joint (riser collar) on the conduit ~~structures to about 2 feet below top of stone blanket~~ (Figure 2-10)	0.060	60
MAPS (no stone blanket)	Remove risers to the connecting joint (riser collar) on the conduit ~~structures at collar where they connect to conduit~~ (Figure 2-9)	0.070	248
Diffuser Port Structures	Remove six structures per discharge conduit (approx. every 500 feet) to ~~about 2 feet below top of stone blanket~~ the connecting	0.070	312

Structure	Removal Approach	Disturbance Area (acres)	Dredge Volume (cubic yards)
	joint (riser collar) on the conduit (Figure 2-11)		
Fish Return Conduit	Remove end of conduit ~~to about 1 foot below~~ so that the mammal exclusion barrier is flush with the top of stone blanket (Figure 2-12)	0.001	5
Monitoring & Navigational Buoys	Remove five buoys, nylon ropes, and anchors (i.e., sinkers or anchor blocks).	0.003	5
	Totals	**1.075**	**1,156**

Sources: COWI 2017; SCE-RP 2018b (buoy anchors).
Acronyms: AOIS = auxiliary offshore intake structures; LOED = large organism exclusion device; MAPS = manhole access port structures; POIS = primary offshore intake structure.

For vertical structures with a stone blanket (POIS, AOIS, some MAPS, and diffuser port structures), dredging would be primarily limited to removal of all the accumulated sediment, which is ~~the~~ estimated to be 2 feet ~~of accumulated sediment~~ thick on top of the blankets and ~~a minimum of the top 1 foot of the blanket~~ remove the stone blanket, which is approximately 3 feet thick, to a 2:1 slope immediately surrounding the vertical structure so that the mammal exclusion barriers would be installed ~~flush or slightly below the top of the blanket~~ after removal of the vertical structures to the collar joint as depicted in Figures 2-7, 2-8, 2-10, and 2-11. Similarly, ~~At MAPS locations~~ for vertical structures without stone blankets (certain MAPS only), dredging would remove about 4 feet of ~~cover~~ backfill material over the conduits and 2 feet of accumulated sediment (estimated 6 feet total). The mammal exclusion barrier would be installed after removal of the vertical structures to the collar joint as depicted in Figure 2-9.

At the five buoy anchor sites, the estimated 2 feet of accumulated sediment would be removed to expose and allow removal of the nylon ropes and the anchor blocks. According to SCE-RP (2018a), the blocks (also known as “sinkers”) are concrete prisms, measuring 5 feet, 5 inches square and 2 feet, 4 inches deep with a 3-inch diameter alloy steel bar in the concrete that connects each sinker to the rope/chain suspending the buoy. Each sinker weighs approximately 9,600 pounds (4.8 tons). The sinkers would be lifted straight up and out of the seabed, leaving a void space which would likely infill with sediment over time due to natural ocean shoaling processes resulting in 2 cubic yards of infill at each of the five sinker locations for a total of 10 cubic yards (SCE-RP 2018b).

Each excavation would have approximately 2:1 side slopes to reduce sloughing of excavation walls during dredging. Dredged materials (e.g., sediment moved to allow for removal of the vertical risers) would either be side-cast or pumped into the Unit 3 intake/discharge conduits or the Unit 2 intake conduit during dispositioning activities, these activities must occur after all planned dilution activities and wastewater discharges (e.g., from the sewage treatment plant) have ceased or been rerouted. To avoid turbidity and keep an option open for the conduit to be used to support Future Activities, such as

dewatering, dredged materials would not be pumped into the Unit 2 discharge conduit. The selected contractor would develop a Dredging Plan (Applicant-proposed measure [APM]-15) before any dredging begins. Dredging methods would: (1) meet U.S. Army Corps of Engineers, CSLC, CCC, and RWQCB standards; (2) use equipment that meets San Diego Air Pollution Control District requirements; and (3) be performed consistent with industry standard practices and approved methods. To minimize turbidity, hydraulic pumping or similar technology is proposed, similar to the previously conducted dredging associated with the SONGS Unit 1 conduit dispositioning.

Offshore structures would be removed using underwater divers, derrick and materials barges, and tug boats (SCE 2017d – DR #1 & #2). Offshore Proposed Project activities would require anchoring and three to four 10- by 10-foot temporary seafloor laydown areas. A Conduit Work Plan will detail vessels and procedures used in the removal of offshore structures and debris. An offshore Spill Response Plan and Anchoring Plan will also be developed prior to the start of offshore activities (see Table 2-5, *Ongoing and Proposed Plans, Programs, and Reports*).

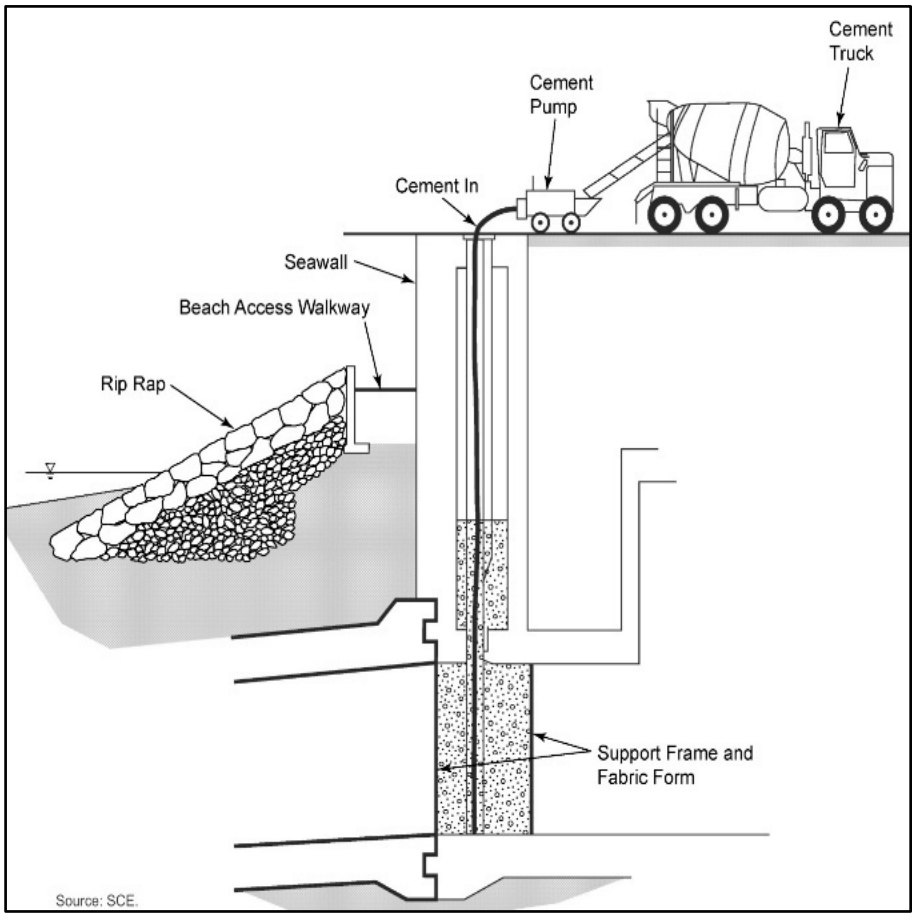
- Vertical structures removed during dispositioning would be placed on the seafloor within the CSLC lease area (temporary laydown area). The location of these three or four approximately 10-foot by 10-foot laydown areas would be determined prior to mobilization and addressed in the Anchoring Plan (SCE-AM 2018e).
- Debris would be marked as needed with temporary buoys, then loaded onto a barge with a high-capacity crane. A push boat would maneuver the barge on-site. Underwater air bags may be used to move the debris from the temporary laydown area to the barge. The process of removing structures from the ocean does not cause the release of radioactivity that is bound into the concrete surface (SCE 2018j – DR#7-6). The debris would be sorted on the barge and tested to determine any detectable levels of radiological contamination. If the debris has been verified to be free of radiological contamination, it would be transported and disposed of or recycled at an appropriate permitted onshore facility. If detectable levels are identified, the debris would be disposed of at a facility licensed for that waste in accordance with applicable regulatory requirements.
- The destination for waste materials transported by barge will not be known with certainty until the Conduit Work Plan is prepared (SCE 2016a – DR #1-53); however, the Port of Long Beach was used for the SONGS Unit 1 conduit dispositioning. SCE (2017d) estimates that one round-trip barge trip would occur between the Proposed Project site and the Port of Long Beach (or other destination), supported by a tugboat for mobilization/demobilization and for towing the loaded barge (see Section 4.13, *Transportation and Traffic*).

2.3.7 Plugging or Sealing Intake/Discharge Conduits at the Seawall

The onshore intake structure, which is part of the circulating water system, consists of large underground tunnels and other large subsurface structures connected to the offshore horizontal intake and discharge conduits. The majority of the onshore intake structure is below sea level and connected to the offshore conduits. Therefore, the onshore intake structure is flooded with seawater. As part of the Proposed Project, the onshore intake structure would be isolated from the offshore conduits so that the onshore intake structure can be partically demolished (as proposed), and subsurface voids can be backfilled. Both the intake and discharge for the Unit 2 and Unit 3 onshore intake structure would need to be isolated in order to perform the proposed decommissioning activities for the entire onshore structure. This also would minimize seawater intrusion during the interim period until final site conditions are determined, which would reduce the need for future dewatering. If future activities require use of the offshore conduits, a modification would be engineered and installed. (SCE 2018j – DR#7-11)

The DGC would use one of two approaches to plug or seal the onshore and offshore portions of the circulating water system structures (Intake/Discharge Conduits): (1) install a concrete plug to block the tunnels or (2) insert and seal the four existing tsunami gates (two each for Units 2 and 3) at the seawall. For the first option, the concrete plug would likely be installed at the Intake Structure stop gate slots at the seawall (Figure 2-13).

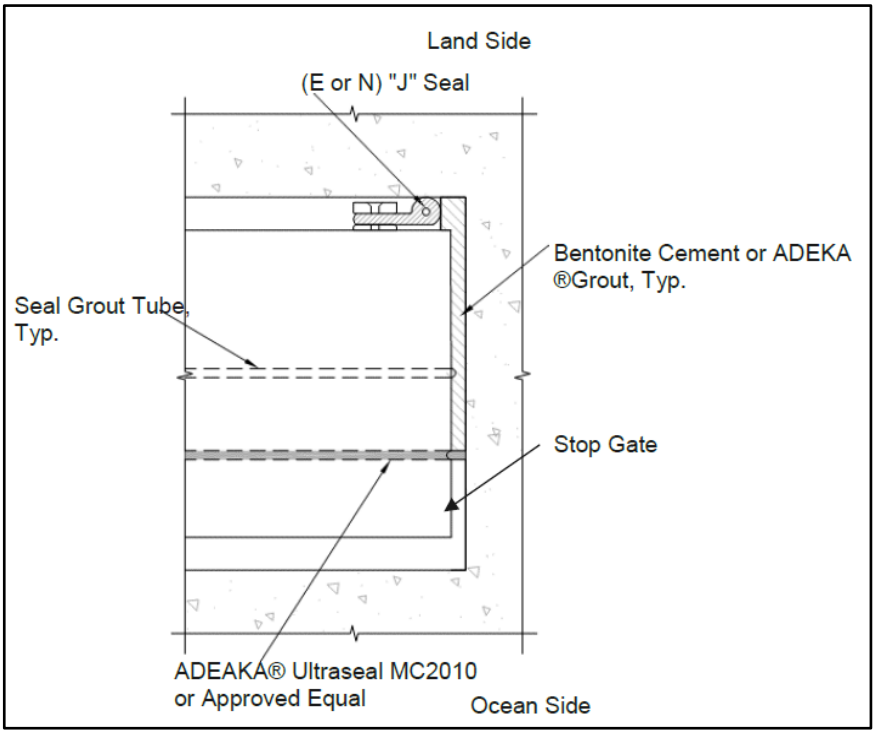
Figure 2-13. Intake Plug at Seawall Option



Divers would install support frames in the tunnels on either side of the gate slot and place a fabric form between frames. Concrete would be pumped into the fabric form to create the plug and isolate the offshore conduits.

Displaced water created by infilling the tunnels with underwater concrete would be pumped to a portable holding tank for disposal.

Figure 2-14. Seal Tsunami Gate at Seawall Option (Plan View)



Source: SCE.

For option two, the tsunami gates would be modified to add a chemically-modified natural rubber on both sides of the west end of the gate and below the gate (Figure 2-14). Grooves along the full height and bottom of the gate would be saw cut to insert (1) an expansive water-tight strip seal (ADEKA® Ultraseal MC-2010MN or approved equivalent) and (2) a recessed grout tube. The inserted seal would expand along three sides of the gate (bottom and two sides). To provide a secondary seal, a grout that expands when exposed to water would be injected using a grout seal tube into the space behind the ADEKA® Ultraseal on the east face of the gate.

Under either approach, the isolation would occur at the seawall in the location of the tsunami gate slots. The top elevation for the tsunami gate slots is approximately -7 feet MLLW. The plug or seal is proposed in a location where remaining substructures are expected to become further buried after the seawall is removed. Further, the plugging or sealing of the offshore conduits at the seawall interface is consistent with the approach approved and implemented for the Unit 1 conduits, where a concrete stop gate was used to isolate the onshore intake structure area from the offshore conduits. The Applicant's future proposal to the DoN for final site restoration, including subsurface structure removal, would take into account the potential for subsurface structure exposure in the absence of the seawall, and would propose an appropriate removal depth (SCE 2018h).

Because the plugging or sealing of the conduits would prevent intake or discharge through the offshore conduits, the concrete plug or gates and seal would not be installed until all Proposed Project dilution activities and wastewater discharges (e.g., from the sewage treatment plant) have ceased or been rerouted. If the Unit 2 discharge conduit is needed for dewatering as part of the Future Activities, the future dewatering system would

be connected to the conduit through a method to be determined at that time (see Section 2.4, *Future Activities*). Once the Unit 2 discharge conduit is no longer needed for any Future Activities, such as dewatering, remaining connections would be closed, diffuser ports and the solid covers would be removed, leaving the mammal exclusion barriers, and the conduit would be abandoned in place. Hazardous material levels (including radioactive contamination levels) for the site would be below regulatory limits (SCE 2016a – DR #1-15).

Since the site subsurface drainage system currently discharges to the Intake Structure, prior to plugging or sealing the conduits, SCE proposes to eliminate or modify the subsurface drainage system to reroute flow to the beach. Removal of the subsurface drainage system from service would allow the site to be graded to collect rainfall and convey surface flows towards existing openings at the top of seawall. This is consistent with the current site design, which assumed a Probable Maximum Precipitation event (12.25 inches of rain over a 6-hour period, including a maximum intensity of 7 inches of rain in 1 hour), where all inlets to the subsurface drainage system are plugged, such that drainage of the site would occur as surface flow. Two main drainage swales (one for each Unit) are in place to direct runoff to the seawall where openings at the top of the seawall (one per Unit) allow surface flow to the ocean (SCE 2016a – DR #1-15).

Per SCE (SCE 2018i), as part of the Proposed Project, all or a portion of the existing subsurface drainage system at SONGS is planned for removal. The Participants propose to backfill the portions of the site onshore ~~site~~ to the existing grade elevation (~30 feet MLLW). The site would then be stabilized and graded in accordance with a Grading Plan (to be submitted as part of SCE's Coastal Development Permit application to the CCC) and the Stormwater Pollution Prevention Plan (SWPPP) for the Proposed Project.

Recognizing the potential for future ground disturbance during implementation of Future Activities, site stabilization options include approaches to minimize the potential for interim habitat development. As described by the State Water Resources Control Board (SWRCB) Construction General Permit (CGP), final stabilization requires that the project site does not pose any additional sediment discharge risk than it did before onset of construction. Filing a Notice of Termination to obtain removal from permit coverage under the CGP requires demonstration of final stabilization. The CGP lists various methods for achieving and documenting final stabilization, which include use of one or more of the following methods: 70% Final Cover Method; Re-vised Universal Soil Loss Equation (RUSLE); or RUSLE2 Method (computational soil loss modeling) Custom Method.

Due to the size and complexity of the Proposed Project, the project-specific SWPPP may require a combination of BMPs throughout the project for final stabilization. These methods would be documented in the SWPPP and on the final stabilization SWPPP map (SCE 2018g). Options to stabilize project areas include: revegetation, such as planting with an upland grass mix or similar so as not to create coastal habitat prior to the

completion of final site restoration as a part of Future Activities; and non-vegetative stabilization (e.g., gravel). The following steps would also avoid compromising the seawall or creating erosion during site grading.

a) **Effects on seawall function/stability**. The proposed backfill elevation would match the existing site grade in the Units 2 and 3 area adjacent to the seawall (~30 feet MLLW). Either native soil or an imported fill material would be backfilled near the seawall and compacted to a level similar to existing conditions to provide the support necessary for the seawall's ongoing stability.

b) **Saturation of fill behind seawall, and any stability implications**. The site would be graded to ensure drainage that directs surface flows toward existing drainage openings at the top of the seawall, or to new penetration openings in the seawall (as stated above). Proper drainage design would prevent significant pooling of water behind the seawall and complete saturation of the backfill is not expected. The original seawall design assumed that water could infiltrate the soil behind the seawall and a soil density of 130 pounds per cubic foot (pcf) was used, which represents compacted native soil (San Mateo sand backfill) at the maximum water content. The current site design accounts for a situation where all site drainage would occur as surface flow to the existing openings at the top of the seawall. The design assumes a Probable Maximum Precipitation event (12.25 inches of rain over a 6-hour period, including a maximum intensity of 7 inches of rain in 1 hour), where all inlets to the subsurface drainage system are plugged. Drainage and erosion control would be addressed as a SWPPP requirement (see Table 2-5).

c) **Surficial erosion on site, transport of sediments to beach/ocean**. The Proposed Project site grading and stabilization would be designed to avoid surficial erosion on the site and/or transport of sediments to the beach/ocean. The State Water Resources Control Board Construction General Permit requires that site stabilization not pose any additional sediment discharge risk that did not exist prior to the onset of construction. Potential stabilization options include gravel or revegetation with an upland grass mix (or similar). In addition, SWPPP compliance would require installation of erosion control devices and Best Management Practices to avoid large-scale erosion.

d) **Erosion of bluff/shoreline if seawall is eventually removed**. The seawall is assumed to remain in place for the Proposed Project duration and therefore, bluff and shoreline erosion without the seawall is expected to be analyzed as part of Future Activities. The Proposed Project assumes that the seawall would remain in place until the SNF is removed from the site, the Approved ISFSI is dismantled, and final site restoration is completed. These Future Activities would be subject to environmental review by the landowner and permitting agencies. The Applicant's proposal to DoN for final site restoration would take into account the potential for

subsurface structure exposure and bluff/shoreline erosion in the absence of the seawall, and would propose an appropriate removal depth and final end state.

Alternatively, if all or part of the subsurface drainage system remained in service after the conduits are sealed, the remaining system could either be directed to an existing opening at the centerline of the SONGS Units 2 and 3 seawall, or a new opening could be built. Drainage from some areas that contribute flow to the existing SONGS subsurface drainage system could be modified to divert runoff prior to entering the site. For example, flow from one of the two 4-foot by 4-foot box culverts at Old Pacific Highway (which is currently routed under the SONGS south access road to the subsurface drainage system) could be modified to drain to the beach. Prior to site development, the area that became the SYFA was a natural mesa and drained by surface flow to the beach. The SYFA would likely be graded to drain to the beach (SCE 2016a – DR #1-15).

Wastewater Treatment Plant

The Onshore Site includes a wastewater treatment plant located at the south end of the NIA, which receives wastewater from the Administrative, Warehouse, and Shop Building and from the oily waste separator located in the ISA. Once the treatment plant is no longer required, and the NPDES permit is terminated or amended as appropriate, the treatment plant's SSCs would be removed using the same technique as described in Section 2.3.2, *Decontamination and Dismantlement*. Because this is a non-radiological facility, it would likely be removed using a large excavator with attachments such as shears and processors. The excavator would demolish the SSCs into a large rubble pile then segregate waste streams as required. Sewage from on-site bathroom facilities, presently handled by the sewage treatment plant (which discharges treated water to the ocean via the Unit 2 discharge conduit), would be diverted to a holding tank after sealing the discharge conduits following completion of any required dewatering activities (see Section 2.4, *Future Activities*), and would be periodically serviced by an outside vendor (SCE 2016a – DR #1-26, 1-50).

Security Modifications

The security infrastructure includes SSCs such as the Security Processing Facility, fences, and gates. These SSCs are not anticipated to be contaminated and most would be removed accordingly. Some modifications to the remaining security infrastructure are likely to be required, including cameras, lighting, observation areas, access points, roads, and access paths/sidewalks. At the beginning of the Proposed Project, SONGS site security would remain at current levels. At the end of the Proposed Project, the security requirements for the SONGS site would likely be limited to the Approved ISFSI.

Construction Equipment Estimates

Construction equipment requirements to support Proposed Project activities would vary depending on the specific activities being performed. Because of the sequencing of Proposed Project work, there would be some overlap in equipment requirements. Table 2-7 identifies typical equipment used to support D&D and ~~Conduit Disposition activities~~ CSLC Lease Offshore Activities.

Table 2-7. Typical Construction Equipment for D&D/~~Conduit Disposition~~ CSLC Lease Offshore Activities

Construction Equipment	Construction Use
Onshore Activities	
50 to 130-ton Excavators	Structure, component removal; waste size reduction; waste segregation and material demolition
Hydraulic Breakers, Shears, Pulverizer, and Grapples	Attachment tools for downsizing structures and debris
2,000-gallon Water Truck & 4,000-gallon Water Truck	Source water for dust suppression
60-foot Boom Lift & 100-foot Boom Lift	Aerial lifts for loading/unloading, inspections, etc.
Cat 973 Track Loader, Cat 966 Rubber Tire Loader, & Bobcat Loader	Waste and/or fill material movement
Concrete Slurry Mixing Equipment	Mixing and placing concrete slurry where needed as backfill
Portable Crushing Equipment	Processing of materials for packaging
Semi End Dump Truck	Off-site debris hauling
40-Ton Off-Road Trucks	On-site hauling of materials
Pickup Trucks	Small material movement on-site; foremen travel
250-ton Crane	Large component lifting and movement
Diesel Generators	Temporary electrical power for construction lighting, pumps, etc.
Backup Diesel Generators	Temporary electrical back-up power
Hyster	Containerized waste movement
Small Forklifts	Containerized waste or consumables movement
Rhino Utility Carts	Equipment and/or people on-site travel
Bulldozer & Grader	Earth-moving equipment for use during earth moving work and or backfill work
Offshore Activities	
100-ton Crawler Crane & 50-Ton Crawler Crane	Bulkhead work, component lifting and movement
200-Ton Crane (Derrick Barge)	Large component lifting and movement
Concrete Saw & Concrete Boom Pump	Shoreline area bulkhead installation
Welding Set	Mobilization and demobilization activities; installation of mammal exclusion barriers
Marine Equipment & Winch Motors	Mobilization; conduit riser, fish return system, and buoy disposition

Table 2-7. Typical Construction Equipment for D&D/~~Conduit Disposition~~ CSLC Lease Offshore Activities

Construction Equipment	Construction Use
Long Reach Excavator	Structure, component removal; size reduction and segregation
50-ton Fork Lift	Component movement
Front-End Loader	Component movement at disposal site (Port of Long Beach)
Concrete Crusher	Concrete size reduction at disposal site
Excavator with Hoe Ram	Concrete size reduction; segregation
20-Ton End Dump Truck	Concrete disposal
Generator	Electrical power source
Compressor	Support for divers

Sources: SCE 2016a (DR #1-6); SCE 2016c – Table 4.

2.3.8 Decommissioning Waste Volumes and Disposal Sites

2.3.8.1 Waste Volumes

Table 2-8 estimates the "as packaged" volume and types of waste generated by the Proposed Project.

Table 2-8. Estimated Proposed Project Waste Volumes and Shipments

Waste Types	Volume (cubic feet)	Weight (tons)	Shipments (Total No.) [1]	
			Truck	Rail
Non-Radioactive Debris[2]	12,606,135	477,302	26,517	0
Non-Radioactive Metal	6,159,600	92,394	5,133	0
Non-Radioactive Total[3]	18,765,735	569,696	31,650	0
Radioactive Class A Debris	5,729,494	175,466	0	354
Radioactive Class A Containerized	80,406	2,211	364	0
Radioactive Class A Large Component	135,977	5,687	0	9
Radioactive Class A Oversize	433,735	14,041	0	25
Radioactive Class A Mixed Waste	3,012	31	2	0
Radioactive Classes B and C Waste	8,242	770	95	0
Radioactive Totals	6,390,867	198,206	461	389
Totals	25,156,602	767,902	32,111	389
Annual Average (assumes 7-year schedule)[4]	3,593,800	109,700	4,587[5]	56

Sources: SCE 2016a – DR #1-29, 1-32, modified; SCE, 2018b.

Notes:

[1] The number of rail shipments calculated for these estimates is based on a maximum volume for rail shipments of 3,000 cubic feet (high-sided gondola car) or a maximum weight of 100 tons. A conservative estimate of six waste railcars per train shipment from the site was used based on prior experience shipping SONGS Unit 1 demolition debris. The number of truck shipments is based on a "roll-off" type waste container and truck, which are available in capacities from 10 to 40 cubic yards. Specific assumptions about peak truck and rail trips by year are included in the air quality calculations (Appendix E (SCE 2016a – DR #1-32).

[2] Volumes shown above do not include the estimated 2,400 tons of non-radioactive concrete waste from the proposed ~~offshore conduit dispositioning~~ CSLC Lease Offshore Activities.

[3] "Non-radioactive" includes all waste that does not meet the NRC regulatory threshold for LLRW governed by 10 CFR Part 61. Non-radioactive waste streams (e.g., concrete and asphalt) would likely be shipped by truck to Arizona (La Paz), Utah, or other out-of-state facility. Executive Order D-62-02 places a moratorium on the disposal of decommissioned materials to Class III landfills and unclassified waste management units in California until regulations are adopted.

[4] In an effort to bound the total project duration, the Proposed Project has been projected to last approximately 10 years (2019 through 2028). Based on the DGC's proposed work approach, and given that portions of this time period would be largely administrative in nature, the DGC estimates that using a 7-year schedule (2019 through 2025) is appropriate for purposes of conservatively analyzing a potential worst-case year for air emissions and traffic/transportation.

[5] Estimates assume no beneficial reuse of concrete or recycling, which results in a worst-case average of ~~5,351~~4,587 truck shipments per year.

This estimate does not include the number of vehicle trips by personnel working at the site. Between 500 and 670 workers would support D&D activities (SCE 2016b – DR #1-11). This is slightly less than the existing number of on-site personnel (approximately 750 people including staff and contractor support [inclusive of Approved ISFSI construction staff], as of May 2016). Helicopters would only be used for occasional SCE staff trips and, if necessary, for medical emergencies. Helicopters would not be used for any decommissioning activities (SCE 2016b – DR #1-35). Assuming a total of 389 rail shipments (SCE 2016a – DR #1-32) results in an average of approximately 56 rail shipments per year during the Proposed Project (see Table 2-8 above). Rail shipments would be loaded on-site during normal working hours (between 6 a.m. and 6 p.m.). Time of day restrictions are likely to be imposed by Pacific Sun Railroad for rail transfers from the site to the Stuart Mesa Railyard and, therefore, loaded rail cars and empty rail cars are assumed to be transported overnight (between 11 p.m. and 5 a.m.) to and from the Stuart Mesa Railyard (SCE 2016a – DR #1-30).

The Applicant proposes to recycle some materials such as ferrous metals. Any scrap metals that meet the NRC's unrestricted release criteria may be sent via truck to the Port of Long Beach, approximately 60 miles from SONGS, for likely recycling outside of the U.S. (SCE 2016a – DR #1-29). Truck monitoring equipment would be used to ensure that radioactivity is not inadvertently released from the site during metal recycling activities.

~~If appropriate and acceptable to the DoN~~In compliance with all applicable regulatory requirements, ~~some clean (non-radioactive/uncontaminated)~~ crushed concrete may be temporarily reused on-site as interim backfill and for other purposes, such as~~. For example, crushed clean concrete could be reused~~ for ramping of trucks and equipment to help with access in and around the site during decommissioning or to support other Proposed Project activities. For the purposes of this EIR's analysis of truck and rail haul trips only, it is assumed that~~,~~ any reused materials would be removed at the Proposed Project completion and no beneficial reuse of concrete as ~~permanent~~ backfill material would occur. Additionally, clean asphalt would not likely be reused on-site but may be recycled (SCE 2016a – DR #1-29). The DGC would assess the feasibility and suitability of any reuse proposal considering applicable regulatory ~~and landowner~~ requirements.

2.3.8.2 Disposal Sites

Potential disposal locations are identified below.

- Class A LLRW would likely be shipped to Clive, Utah, approximately 800 miles from SONGS. Oak Ridge, Tennessee, about 2,200 miles away, also stores Class A contaminated waste. Class A/B/C LLRW could be shipped to Andrews, Texas, approximately 1,175 miles from SONGS. All three locations have an existing rail unloading facility (SCE 2016a – DR #1-30). If available, the Participants may use other licensed Class A, B, or C LLRW facilities or an NRC exempt facility.
- Non-radiological wastes are proposed to be trucked to the La Paz County Landfill in Arizona, near the Arizona/California border east of Blythe, California. Federally non-regulated/non-radiological designated wastes represent ~~80~~75 percent or more of the total waste estimated to be generated by the Proposed Project.

SCE has confirmed that the sites listed above have the capacity to receive the decommissioning waste. More specifically, the facility in Clive, Utah could take all waste material generated at the SONGS site as part of the Proposed Project, except for Class B and Class C waste materials. The current remaining capacity at Clive is approximately 115 million cubic feet. Currently, the facility in Andrews, Texas, which is planned to be used for SONGS Class B and Class C wastes, has used less than 2 percent of its total 9 million cubic-foot capacity. The DGC currently anticipates processing nominal volumes of SONGS material at Oak Ridge, Tennessee, and the local disposal facilities in Tennessee have adequate capacity to dispose of the associated waste (SCE 2018d).

The La Paz County Landfill has been identified by SCE as a suitable disposal facility for SONGS non-recyclable, non-radioactive debris because of its location, conveyance access (truck and rail), capacity, and its permitting classification allowing acceptance of this waste type. The landfill has over 25 million tons of available permitted capacity today and has historically received municipal solid waste, California hazardous and industrial waste, and special waste streams by truck and rail from California, Arizona, Nevada and other southwestern U. S. generators (SCE 2016l – DR #3-2).

2.3.9 Import Volumes

Based on the best available information to date and existing facility drawings, an estimated 260,000 to 320,000 cubic yards (7 to 8.6 million cubic feet) of backfill material may be needed to fill open volumes (voids) in existing structures below grade (SCE 2016a – DR #1-33, 1-37). The backfill source/location is assumed to be a quarry in Irwindale, CA, about 66 miles from SONGS (SCE-AM 2018b). The site and all soil materials would be stabilized in accordance with SWPPP requirements. SCE and its DGC would identify a material during SWPPP development that would be compatible with the surrounding natural environment (i.e., grain size, texture, and color) and that meets permit stabilization requirements. The permanent backfill requirements, which could include retention of the

interim backfill following completion of the Future Activities, would be subject to landowner and permitting agency environmental review and approval (SCE 2018g). The bulk of this backfill material would be placed during the latter part of the Proposed Project. Before then, the DGC may use small amounts of temporary fill for personnel safety and equipment access. For estimates of the number of backfill shipments needed during the Proposed Project as well as fuel delivery trips, refer to the air quality calculations (Appendix E). The DGC would likely use a combination of imported clean soil, aggregate backfill material, and concrete slurry. The specifications for backfill have not been determined; therefore, the final estimate for each type of material cannot be determined (SCE 2016a – DR #1-37).

~~Cal-EPA (2001) has issued guidelines regarding backfill material:~~

> ~~*In general, the fill source area should be located in nonindustrial areas, and not from sites undergoing an environmental cleanup. Nonindustrial sites include those that were previously undeveloped or used solely for residential or agricultural purposes. If the source is from an agricultural area, care should be taken to ensure that the fill does not include former agricultural waste process byproducts such as manure or other decomposed organic material. Undesirable sources of fill material include industrial and or commercial sites where hazardous materials were used, handled or stored as part of the business operations, or unpaved parking areas where petroleum hydrocarbons could have been spilled or leaked into the soil. Undesirable commercial sites include former gasoline service stations, retail strip malls that contained dry cleaners or photographic processing facilities. Undesirable industrial facilities include metal processing shops, manufacturing facilities, oil refineries, waste treatment plants, etc. Alternatives to using fill from construction sites include the use of fill material from soil pits in rural and suburban areas. However, care should be taken to ensure that those materials are also uncontaminated.*~~

~~Consistent with Cal-EPA guidelines, SCE plans to use only clean offsite fill materials. No use of material from contaminated structures (neither clean nor contaminated) would be permanently used as backfill.~~ For purposes of the truck and rail haul trip analysis, it is assumed ~~A~~all backfill materials would come from offsite sources (SCE 2016a – DR #1-33, 1-37).

2.3.10 Water Use and Power Supply

During decommissioning, total water usage to support the decommissioning is estimated to be approximately 102 million gallons (313 acre-feet), of which 77.5 million gallons (238 acre-feet) of water would be needed for dust suppression, potable water use, and fire protection (SCE 2018a, Table 2-9). During SONGS Unit 1 decommissioning, a misting system was used during concrete demolition and crushing (SCE 2016a – DR #1-38). A misting system ring installed on an excavator arm directed a focused concentration of

mist through nozzles at the cutting area of the shear or hydraulic hammer. Misters can also be deployed on man lifts or by personnel on the ground.[19]

Table 2-9. Estimated Proposed Project Water Use

Use	Total (million gallons)	Total (acre-feet)
Dust Suppression, Potable Water, Fire Protection[1]	77.5	238
Support of Site Personnel[2]	23.5	72
Fill of Reactor Cavities[3]	1	3
Total	**102**	**313**

Notes:

[1] Based on 200,000 gallons of water average per week, 50 weeks per year, for 7 years, and based on a reduced usage of 50,000 gallons of water average per week, 50 weeks per year, for the remaining 3 years of the Proposed Project (SCE 2018c).

[2] Includes sanitary systems. Assuming maximum site personnel (DGC and SCE) is 670 during the 10-year Project, each person works 250 days per year, and each person uses 14 gallons per day.

[3] Required to provide radiation shielding for the segmentation personnel. The DGC plans to reuse available on-site water (approximately 750,000-800,000 gallons of water is currently available). The additional 200,000-250,000 gallons needed would be drawn from the municipal water supply readily available on site. (SCE 2018j – DR#7-5)

When practicable, rain and stormwater collected in on-site sumps (approximately 13 sumps of various capacities), which is normally discharged per existing permits through offshore conduits, could be used for dust control. Otherwise, most of the water used for dust suppression would likely come from on-site hydrants under the SCE contract with the South Coast Water District's Joint Regional Water Supply System (SCE-AM 2018a).

In addition, approximately 23.5 million gallons of water would be used by onsite personnel during the Proposed Project (SCE 2018a).[20] The Approved ISFSI also requires fire hydrant coverage, which will be fed from a potable water supply line. No potable water use is anticipated to disposition the SONGS Unit 2 and Unit 3 offshore conduits as all work activities would occur offshore (SCE 2016a – DR #1-51). Approximately 1 million gallons of water would be required to fill both reactor cavities in preparation for reactor vessel segmentation work (see Section 2.3.3.2, *Reactor Vessel and Internals Removal*).

The existing 10-megawatt (MW) ring bus would continue to be used for power during decommissioning. The ring bus was installed in 2016, with CCC approval, for C&D work. It currently supplies remaining operational plant systems, including: the SFPI; Approved ISFSI; dilution and sump pumps; heating, ventilation, and air conditioning (HVAC) equipment (chillers, fans, etc.); lighting; and office needs. Near the end of the Proposed Project, the ring bus would be partially demolished; the remaining portion may be modified

[19] Another effective technique used during demolition of highly contaminated structures is the Martin® Fog Cannons®, which can provide both local and general-area misting (SCE 2016a – DR #1-38). These units deliver approximately 14 gallons per minute of mist to the area undergoing demolition operations.

[20] This total is calculated as follows: the Approved ISFSI security building, which includes restrooms, is staffed 24/7 by at least three people and is designed for occupancy by 17 staff (SCE 2016a – DR #1-26); assuming maximum site personnel (DGC and SCE) is 670 during the 10-year Project, each person works 250 days per year and uses 14 gallons per day, total water consumption would equal 23.5 million gallons.

slightly to support operational activities of the Approved ISFSI, including the security building in the NIA. The average load during Proposed Project activities would be about 25 percent of the ring bus's capacity (2.5 MW) (SCE 2016a – DR #1-28). If additional power is required, temporary power may be obtained from one or more on-site sources, such as existing switchyard transformers. In rare instances, temporary diesel generators may be required (these emissions are captured in the air quality assumptions).

2.3.11 Site Conditions at End of Proposed Project

Upon Proposed Project completion, all above-grade structures and all below-grade structures to at least 3 feet (in most cases, not more than 21 feet [elevation 9 feet MLLW] below the existing SONGS Units 2 and 3 grade) would have been removed from the site, as required to meet radioactivity release criteria in accordance with NRC regulations for unrestricted use of the SONGS site and other factors mentioned above. To ensure NRC criteria are met, the following activities would occur in the Proposed Project's later stages.

- **Perform Final Status Survey(s)**. Any remaining below-grade SSC must meet NRC release requirements for unrestricted use. This is done by first performing a Final Status Survey on all remaining structures and soil areas in and around the structures, then isolating the area until an independent third party, selected and managed by the NRC, verifies the Final Status Survey data through additional surveys. The Final Status Survey includes taking soil samples related to remaining building and structure foundations (basemats) or the floor. Sufficient soil samples from unexcavated areas would be taken to determine if a leak of contaminated systems has occurred and impacted surrounding soils. If no part of the structure remains, the soil in the open hole would be surveyed or sampled. Once a conduit is no longer needed, and the potential for further cross-contamination no longer exists, a contamination survey would be performed. Divers would enter the intake and discharge conduits through the onshore intake structure and offshore MAPS to collect samples of the conduits at multiple locations in accordance with a survey plan (to be developed). The samples would be analyzed for radioactivity and other non-radiological hazards. Survey results could serve as the Final Status Survey for each offshore conduit. A similar process was performed during Unit 1 conduit dispositioning (SCE 2016a – DR #1-13), and related testing was recently conducted on the Unit 2 and Unit 3 conduits (CB&I 2017).
- **Backfill and Grade.** After the Final Status Survey verifies that the remaining below-grade structure or open hole meets NRC release criteria for unrestricted use, it would be backfilled and compacted as necessary to minimize any settling. The Onshore Site would be graded and stabilized to remain in a safe configuration until the start of the Future Activities. Per the Applicant the SONGS Unit 2 and Unit 3 area grade would be restored to the current nominal grade elevation of 30 feet MLLW (SCE 2016a – DR #1-37). Grading and stabilization would be performed per the requirements of the SWPPP.

Once NRC decontamination requirements are met, a licensee would typically abandon in place remaining subsurface structures; however, in the case of SONGS, part of the Future Activities (see Section 2.4) will account for any additional landowner requirements (SCE 2016a – DR #1-44). The DoN would determine the degree of any additional below-grade SSC removal, which, in conjunction with other regulatory requirements, would form the Future Activities, including final site grade.

Components of SONGS that would remain at the end of the Proposed Project are identified in Figure 2-3. They include: Shoreline Site components (including riprap covered by the CSLC lease), Approved ISFSI, SONGS Unit 1 subsurface materials under the Approved ISFSI, utilities supporting the NIA and SYA, switchyard and related appurtenances, security features, access roads, some parking areas, and gunite slopes. These facilities will be addressed as part of the Future Activities including final disposition of the Onshore Site (see Section 2.4), following National Environmental Policy Act (NEPA) review by the DoN. Final erosion and drainage work would also be performed as instructed by the DoN.

2.4 FUTURE ACTIVITIES (~2035)

The timing and scope of Future Activities is currently unknown. Future Activities depend on landowner requirements for final Onshore and Shoreline Site restoration. As noted above, the CCC will also revisit the Approved ISFSI location in 2035. Additionally, in August 2017, as described in Section 1.5.2, *Uncertainty Regarding Future Decommissioning Plan Activities*, SCE agreed to use “commercially reasonable” efforts to relocate SONGS SNF to an off-site storage facility, which would require that the DOE identify a permanent repository or interim storage facility for SNF. If a suitable off-site SNF storage facility is available, the Future Activities would include packaging and shipping of SNF off-site and dismantlement of the existing Approved ISFSI and remnant Unit 1 SSCs, if required by the NRC or the DoN. If no suitable off-site SNF storage facility is available by 2035, and if the CCC or NRC determines that the Approved ISFSI needs to be moved, the Future Activities would involve relocation of the SNF to a new Approved ISFSI and the operation and maintenance of that new Approved ISFSI. Relocation would likely require reconfiguration of the security features. (See Appendix D1 for more information regarding the management and disposal of SNF and high-level radioactive waste associated with SONGS, including on-site storage and off-site transportation and disposal.)

2.4.1 Additional Onshore Substructure Removal

The DoN may require future removal of additional onshore below-grade structures and site restoration. The Applicant proposes to perform this work as part of the Future Activities, after more information about the timing for SNF dispositioning is known. The DoN’s decision regarding additional removal of below-grade structures or site restoration would be made following a NEPA review by the DoN. Additional removal of onshore

below-grade structures and site restoration are addressed as alternatives in this EIR (see Section 5.0, *Project Alternatives Analysis*) for informational purposes only.

If dewatering is required for future onshore subsurface removal (i.e., work below the water table), a separate dewatering system would be installed to create a dry work environment. This is expected to be evaluated as part of the DoN's NEPA review. If dewatering is necessary for the Future Activities, then the effluent would be discharged in compliance with regulatory requirements through the Unit 2 discharge conduit, as described in Section 2.3.6.2, *Offshore Discharge System and Proposed Project Discharges*. Stormwater would be managed in accordance with a SWPPP.

2.4.2 Preparation of Spent Nuclear Fuel for Off-site Shipment

Packaging and shipment of SNF off-site is assumed to be a part of the Future Activities. The dry storage system and transportation cask safety analysis reports (SARs) contain descriptions of activities that would be conducted to unload canisters from dry storage and then load them into transportation casks. The U.S. Department of Energy (DOE) is also preparing "Initial Site-Specific De-Inventory Implementation Plans" for shutdown nuclear power plant sites, which will cover all aspects of site de-inventory, including concepts of operations, mobilization, security, emergency response, readiness, and operations demobilization. Table 2-10 provides a high-level overview of the process for packaging and shipping SNF off-site (SCE 2016a – DR #1-14). See Appendix D3 for more information about actions required to remove SNF and high-level radioactive waste from SONGS and transport it to an off-site disposal or storage facility.

Table 2-10. Overview of Process for Packaging and Shipping SNF Off-Site

1. Engineering personnel confirm that dry storage canister and SNF characteristics comply with the transportation cask license (e.g., dry storage canister model, fuel type, minimum required cooling time, maximum allowed burnup).
2. Personnel performing cask handling and processing operations are trained.
3. Auxiliary equipment, including lifting devices, is inspected and certified.
4. DOE delivers the transportation cask and auxiliary equipment to the site. For SONGS Decommissioning, delivery would occur via rail.
5. A high-capacity mobile crane is used to remove the empty transportation cask from the rail car, and to place the loaded transportation cask back onto the railcar.
6. The transportation cask is inspected and prepared to receive the dry storage canister.
7. The dry storage canister is transferred to the transportation cask employing much of the same equipment used to move a loaded dry storage canister from the reactor facility to the Approved ISFSI.
8. The transportation cask is prepared for shipment on the railcar, which includes installing cask seals, leak testing, installing the cask on its cradle, installing impact limiters, and installing personnel barriers.
9. Final inspections are performed of the loaded railcar.
10. DOE assumes ownership of the loaded transportation cask at the site boundary and ships it to the interim storage facility or permanent geologic repository.

2.4.3 Independent Spent Fuel Storage Installation Removal, Site Restoration, and Final Work within Lease Area

Future Activities would involve agency-mandated final site restoration work that is contingent on Approved ISFSI removal and would end with any activities needed for final NRC license termination. As part of decommissioning at that time, the Approved ISFSI would be dismantled, as would all or portions of the structurally inter-related seawall (which currently acts as a security barrier), public beach access walkway, and riprap (see Table 2-3 above). The CSLC, CCC, and DoN would determine how the portions of the seawall, public beach access walkway, and riprap located within their respective jurisdictions would be decommissioned as part of their respective reviews of the future activities.

For the CSLC lease, the Applicant proposes to remove exposed riprap above the beach surface (to approximately -2 feet MLLW based on current tidal data) and abandon any remaining riprap in place (SCE 2016a – DR #1-19). Once the Unit 2 discharge conduit is no longer needed for Future Activities (e.g., dewatering), the solid covers would also be removed, leaving the mammal exclusion barriers in place. If required by the Commission, the remaining 114 diffuser ports on the Unit 2 and 3 discharge conduits (126 total minus 12 removed during the Proposed Project) would also be removed.

2.5 PROJECT SCHEDULE AND WORKFORCE ESTIMATES

The Proposed Project would extend over a maximum 10-year period (see Figure 2-15). The majority of Proposed Project activities would occur Monday through Friday during daylight hours with a 10-hour work shift between 6 a.m. and 6 p.m. (i.e., 6 a.m. to 4 p.m., 7 a.m. to 5 p.m., or 8 a.m. to 6 p.m.) (SCE 2016a – DR #1-22).

Figure 2-15. Estimated Project Schedule

Project Component	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Mobilization										
Site Preparation										
Onshore Decontamination & Dismantlement, Infrastructure Removal, and Interim Grading										
~~Offshore Conduit Disposition~~ CSLC Lease Offshore Activities										
Demobilization										

Source: SCE-AM 2018c.

Weekend and nighttime work may be needed to avoid interrupting critical work activities (e.g., reactor vessel internals segmentation, which would occur inside the Containment Buildings [SCE 2018b – DR #5-3]) or to meet key milestones; if required, portable lighting

would be used in work areas. Rail car delivery/removal (see Section 2.3.8, *Decommissioning Waste Volumes and Disposal Sites*) and off-site trucking (empty trucks returning or loaded trucks departing) may also occur at night (SCE 2018b – DR #5-3). Meeting the schedule could also require DGC staff working double shifts or on weekends; these periods of time are uncertain and expected to only occur only sporadically (SCE 2018b – DR #5-3). Lighting to support nighttime work would be similar to baseline conditions (SCE 2018b – DR #5-3).

Initially, about 400 SONGS personnel and 100 DGC personnel would comprise the average on-site workforce during the Proposed Project. These numbers would increase to an estimated 100 SONGS personnel and 570 DGC personnel during the peak of the Proposed Project. Per the terms of the DGC contract and Project Maintenance Agreement, use of union labor is required, specifically the four trades used for D&D; field non-manuals would be hired from local skilled professionals (SCE 2017b). The workforce would largely be from the local area. Workers outside the area would likely stay in nearby rental housing (e.g., in San Clemente, Dana Point, and Oceanside).

2.6 APPLICANT-PROPOSED MEASURES

SCE has committed to implement the APMs listed below. The full text of each measure is included in the impact analysis provided in Section 4.0, *Environmental Impact Analysis*, as well as in Section 7.0, *Mitigation Monitoring Program*. In addition, Table 4-2, in Section 4.0, *Environmental Impact Analysis*, summarizes the applicable environmental issue (impact) area for each APM (e.g., Section 4.1, *Hazardous and Radiological Materials*).

- APM-1: Waste Management Program
- APM-2: Hazardous Materials Business Plan
- APM-3: Vehicle Emission Reductions
- APM-4: Dust Suppression
- APM-5: Vehicle Speeds
- APM-6: Track-Out to Public Streets
- APM-7: Tarping Trucks
- APM-8: Nesting Bird Deterrents
- APM-9: Conduit Work Plan
- APM-10: Cultural Resources Protection
- APM-11: Appropriate Treatment of Human Remains
- APM-12: Stormwater Pollution Prevention Plan
- APM-13: Spill Prevention Control and Countermeasure Plan
- APM-14: Spill Contingency Plan
- APM-15: Dredging Plan
- APM-16: Turbidity Monitoring
- APM-17: Offshore Spill Response Plan
- APM-18: Notification to Local Mariners
- APM-19: Emergency Services Access

- APM-20: Oversize/Overweight Loads
- APM-21: Pedestrian and Bicycle Access and Safety
- APM-22: Private Aids to Navigation

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3.0 CUMULATIVE PROJECTS

This section provides maps and a list of other projects near the location where the San Onofre Nuclear Generating Station (SONGS) is scheduled to be decommissioned. These projects are also considered in the cumulative impact analyses presented in Sections 4.1 through 4.14 of this Environmental Impact Report (EIR). Disposition of the CSLC Lease Facilities is part of the larger, long-term plan to decommission SONGS (hereinafter "SONGS Decommissioning Plan"), which has three components (see Section 1.0, *Introduction,* Table 1-1):

- **Approved Independent Spent Fuel Storage Installation (Approved ISFSI) ~~Expansion,~~ Operation~~,~~ and Maintenance** (2015 through 2035) – Component 1
- **Proposed Project** (2019 through 2028) – Component 2 (the project – as defined in California Environmental Quality Act [CEQA], § 21065 and State CEQA Guidelines, § 15378 – that is analyzed in this EIR)[21]
- **Future Activities** (estimated to begin in 2035) – Component 3

State California Environmental Quality Act (CEQA) Guidelines section 15130 requires that an EIR discuss cumulative impacts of a project when the project's incremental effect may be cumulatively considerable.[22] As defined in State CEQA Guidelines section 15355:

> *Cumulative impacts refer to two or more individual effects, which, when considered together, are considerable or which compound or increase other environmental impacts. (a) The individual effects may be changes resulting from a single project or a number of separate projects. (b) The cumulative impact from several projects is the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time.*

State CEQA Guidelines section 15130 includes the following additional guidance.

- Subdivision (a)(1) – An EIR should not discuss cumulative impacts which do not result in part from the project evaluated in the EIR.
- Subdivisions (a)(2) and (a)(3) – When the combined cumulative impact associated with the project's incremental effect and the effects of other projects:
    - Is not significant, the EIR shall briefly indicate why the cumulative impact is not significant and is not discussed in further detail in the EIR

[21] CEQA and the State CEQA Guidelines are found in Public Resources Code section 21000 et seq. and California Code of Regulations, title 14, section 15000 et seq., respectively.

[22] "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects. (State CEQA Guidelines, § 15065, subd. (a)(3).)

  - Is less than significant, the Lead Agency shall identify facts and analysis supporting this conclusion
- Subdivision (b) – The discussion of cumulative impacts:
  - Shall reflect the severity of the impacts and their likelihood of occurrence
  - Need not provide as great detail as is provided for the effects attributable to the project alone.
  - Should be guided by the standards of practicality and reasonableness
  - Should focus on the cumulative impact to which the identified other projects contribute rather than the attributes of other projects which do not contribute to the cumulative impact.

Key elements to consider when assessing cumulative impacts include:

- The type and characteristics of the resource (e.g., aesthetics, air quality, biological resources, cultural resources)
- The geographic (spatial) limits of a cumulative effect; for example, noise impacts are typically localized, while air quality impacts tend to disperse over a large area
- The timing and duration of the proposed Project relative to the past, present, and reasonably foreseeable cumulative projects identified (such as the construction season for temporary construction projects or long-term operation if applicable)

3.1 METHODOLOGY

For use in conducting the cumulative impact analysis, information was collected on closely-related projects in the SONGS vicinity that are in the planning stages, adopted, under construction, or completed and whose impacts have the potential to combine with similar impacts caused by the Proposed Project, thereby contributing to cumulative impacts. Information has been collected on:

- Projects located in the immediate onshore, nearshore, and offshore areas of Marine Corps Base Camp Pendleton (MCBCP) and nearby Orange and San Diego Counties, including the cities of San Clemente, Dana Point, and Oceanside
- Closely-related projects (i.e., projects closely related to the types of activities that would occur during the Proposed Project, as discussed in Section 2.3, *Proposed Project Activities*, and Section 2.5, *Project Schedule and Workforce Estimates*, including Figure 2-15, of this EIR, respectively), such as offshore or shoreline construction or restoration, and other energy-related or decommissioning projects

The information on projects was provided by the jurisdiction in which the project is located or by the responsible agency reviewing or permitting the project (e.g., CSLC, California Coastal Commission [CCC]). The information was current at the time it was provided by

each jurisdiction in the late summer and fall of 2016. Additional information on projects was gathered by CSLC's staff and consultant.

To assess if impacts of the Proposed Project and closely related projects are cumulatively considerable, this EIR considers the following circumstances: the type of resource affected; the proximity of the projects; where an impact might occur (e.g., offshore, onshore, both); when projects may occur; and the duration of the Proposed Project's construction impacts. The geographic scope of cumulative effects may extend beyond the scope of the direct, but not indirect, Proposed Project effects. The geographic scope of cumulative effects may be broader than that illustrated in Figures 3-1 and 3-2 for certain environmental disciplines where impacts could combine in broad areas (e.g., air quality and marine biological resources; this is described in each section's analysis). In addition, each cumulative project has its own implementation schedule, which may or may not overlap with the Proposed Project schedule. Table 3-1 provides a general summary of the geographic scope used to define cumulative projects.

Table 3-1. Cumulative Project's Geographic Scope

Issue Area	Geographic Scope for Each Issue Area
Hazardous and Radiological Materials	This geographic scope is limited to the immediate vicinity surrounding the Proposed Project site and along waste transport routes. No projects identified during the cumulative impacts analysis presented any radiological risk or hazard or involved the use of radiological materials. Current and past land uses on the Proposed Project site are the most significant factors in evaluating the potential for environmental contamination. As there is limited potential for radioactivity to be transferred outside the site's boundaries, radiological hazards associated with Proposed Project decommissioning activities would be limited to the Proposed Project site or, possibly, immediately adjacent areas. During transport of radioactive waste materials to out-of-state disposal facilities, trucks and trains hauling waste would likely use some of the same highways and rail lines used to carry similar materials, particularly as these routes converge at waste disposal facility locations.
Aesthetics	This geographic scope is limited to the area within about 1.5 miles of the Proposed Project site since public views of the SONGS facility are generally only available within this area. Most public views of the facility are from I-5 and nearby beach areas and views of SONGS from these areas are generally only available from less than 1 mile away due to the nature of the local topography; however, some higher elevation areas have views of SONGS facility from up to about 1.5 miles away.
Air Quality	This geographic scope includes the entire affected air basins/local jurisdictions for the assessment of cumulative regional impacts, which is consistent with SCAQMD (2003) and County of San Diego (2007b) guidance. The geographic scope for the assessment of localized sensitive receptor cumulative impacts a 1-mile radius from the project site, consistent with County of San Diego guidance. Emission sources for the Proposed Project are all ground-based with minimal exhaust plume buoyancy, so local air quality impacts will be highest within the Proposed Project site and will

Table 3-1. Cumulative Project's Geographic Scope

Issue Area	Geographic Scope for Each Issue Area
	decrease rapidly with distance, so localized air quality impacts would not be cumulatively considerable beyond 1 mile from the Proposed Project site.
Biological Resources	Onshore Proposed Project activities would occur within the boundaries of the SONGS facility, which is a fully developed site. Therefore, biological impacts would be limited to localized disturbances, including indirect disturbance of immediately adjacent areas (e.g., noise, dust, nearby human activity). Because biological impacts would be very localized, the geographic scope for terrestrial cumulative biological resource impacts would be limited to an area within 0.25 mile of the Proposed Project site. ~~Offshore conduit dispositioning~~ CSLC Lease Offshore aActivities would occur within existing lease areas, but impacts could affect surrounding waters. Because fish, marine mammals, and other marine wildlife can move through these waters, the geographic scope for cumulative impacts to marine biological resources can extend out several miles from the offshore conduits for Units 2 and 3.
Cultural and Paleontological Resources	This geographic scope encompasses the northern San Diego County coastal area bounded inland by I-5. The importance of any individual resource is judged in terms of its regional context and relationship to other resources. This geographic area represents an area where cultural or paleontological resources are likely to be found that are of a similar nature to those that that could be affected by the Proposed Project.
Cultural Resources – Tribal	This geographic scope encompasses the same area as described for cultural resources, and is defined as the northern San Diego County coastal area, extending from the city of San Clemente in the north to the city of Del Mar in the south, and bounded in the inland region by I-5. Similar to cultural resources, this geographic area represents an area where Tribal cultural resources are likely to be found that are of a similar nature to those that that could be affected by the Proposed Project.
Geology, Soils, and Coastal Processes	This geographic scope is the Proposed Project site and immediately adjacent area. This is because impacts related to geology and soils generally occur in a localized area and have very little potential to combine with similar impacts in more distant locations. For coastal processes, cumulative impacts would be contained within the Oceanside Littoral Cell, which extends along the coast from Dana Point Harbor to Point La Jolla. The greatest potential for cumulative effects would be in the northern portion of this cell, generally between Dana Point and Oceanside.
Greenhouse Gas Emissions	GHG emissions contribute to a cumulative effect on climate change that results in an overall increase in global temperatures, which in turn has various environmental effects. Impacts from project-level GHG emissions, unlike for criteria air pollutant emissions, are not localized impacts but rather are global climate change impacts. Therefore, GHG emissions for the Proposed Project are analyzed as a global cumulative impact, so a separate cumulative impact analysis is not needed and was not performed.
Hydrology and Water Quality	In the marine environment, water quality impacts would affect the immediate area and become more dispersed and less significant as distance increases. Therefore, the geographic scope for cumulative impacts in the marine environment could extend for several miles. Water quality and hydrology impacts on shore would be limited to the local drainage basin, which only

Table 3-1. Cumulative Project's Geographic Scope

Issue Area	Geographic Scope for Each Issue Area
	collects surface flows from the SONGS facility and a portion of I-5. This drainage area extends only about 0.5 mile from the Proposed Project site.
Land Use and Planning	Cumulative impacts to land use and planning could result from conflicts with any applicable land use plans, policies, or regulations adopted for the purpose of avoiding or mitigating environmental impacts, or from disrupting, displacing, or dividing existing or approved land uses. The geographic scope for cumulative impacts related to land use includes the area within a 5-mile radius of the SONGS facility because all short- and long-term direct and indirect impacts associated with land use are reasonably expected to occur within this area or closer to the Proposed Project site.
Noise	This geographic scope is conservatively limited to an area within approximately 1 mile of the Proposed Project site. This geographic extent is appropriate because noise impacts are localized and noise levels steadily decrease over distance. At distances greater than 1 mile, impulse and steady construction/demolition noise would generally attenuate such that the level of noise would be below, or blend in with, background noise levels.
Recreation and Public Access	This geographic scope is limited to the area encompassing nearby recreational resources within about 5 miles of the Proposed Project site. This area is appropriate because the Proposed Project's recreational impacts would be limited to localized disruptions and disturbances, and possible increased use of nearby recreational facilities that offer camping.
Transportation and Traffic	This geographic scope encompasses the area that contains the local roadways and intersections connecting SONGS and I-5 that would be used as haul routes and by commuting workers. These roadways and intersections are within 2 miles of the Proposed Project site. The Proposed Project's impacts on traffic operations on I-5 are negligible and, therefore, the cumulative impact area does not need include the segments of I-5 leading to and away from the SONGS facility. For potential cumulative impacts related to marine transport, the geographic area of analysis includes marine travel routes between SONGS and the Los Angeles/Long Beach harbor complex, which is located about 45 miles north of SONGS.
Utilities and Public Service Systems	This geographic scope is defined by the jurisdictions that provide services to the SONGS facility. Because SONGS provides some of its own services (i.e., security, fire, wastewater) with support from MCBCP, the geographic area for some cumulative impacts is very localized and is contained within the boundaries of MCBCP. For other services, such as water and emergency medical services, the geographic area for cumulative impacts includes communities in north San Diego County and south Orange County, such as Oceanside, San Clemente, and Dana Point. Decommissioning waste from the Proposed Project will be transported out-of-state for disposal (i.e., Arizona) and, therefore, there is no specified geographic area in California for cumulative impacts relative to solid waste.

Cumulative impacts evaluated in this EIR would likely represent a "worst-case" scenario since not all the cumulative projects will be approved, constructed, or coincide with Proposed Project activities. Other projects would likely be, or have been, subject to

unspecified mitigation measures that would reduce their impacts and thereby reduce the potential for contributing to cumulative impacts.

The cumulative impact analysis is only able to consider future projects that are reasonably foreseeable, meaning future projects that were either proposed or approved at the time the EIR analysis was initiated. Although potential cumulative projects proposed during Future Activities (SONGS Decommissioning will occur over several decades with currently scheduled completion in 2051) are not foreseeable at this time, such projects would likely generate impacts similar to the cumulative projects listed for this EIR (see Figure 3-1 and Figure 3-2, and Table 3-2 in Section 3.2.8, *Cumulative Projects List*).

3.2 RELEVANT CUMULATIVE PROJECTS

For preparation of the cumulative projects list, the following agencies were contacted for a current list of projects within their respective jurisdictions. These jurisdictions were considered the most likely source of past, present, and future projects that could contribute to cumulative impacts given their proximity to SONGS. These jurisdictions also include sites for the Proposed Project's public engagement process and, as such, they have a continued interested in the Proposed Project's environmental analysis.

- Marine Corps Base Camp Pendleton
- City of Carlsbad (County of San Diego)
- City of Dana Point (County of Orange)
- City of Oceanside (County of San Diego)
- City of San Clemente (County of Orange)
- City of San Juan Capistrano (County of Orange)
- County of Orange
- County of San Diego
- North County Transit District

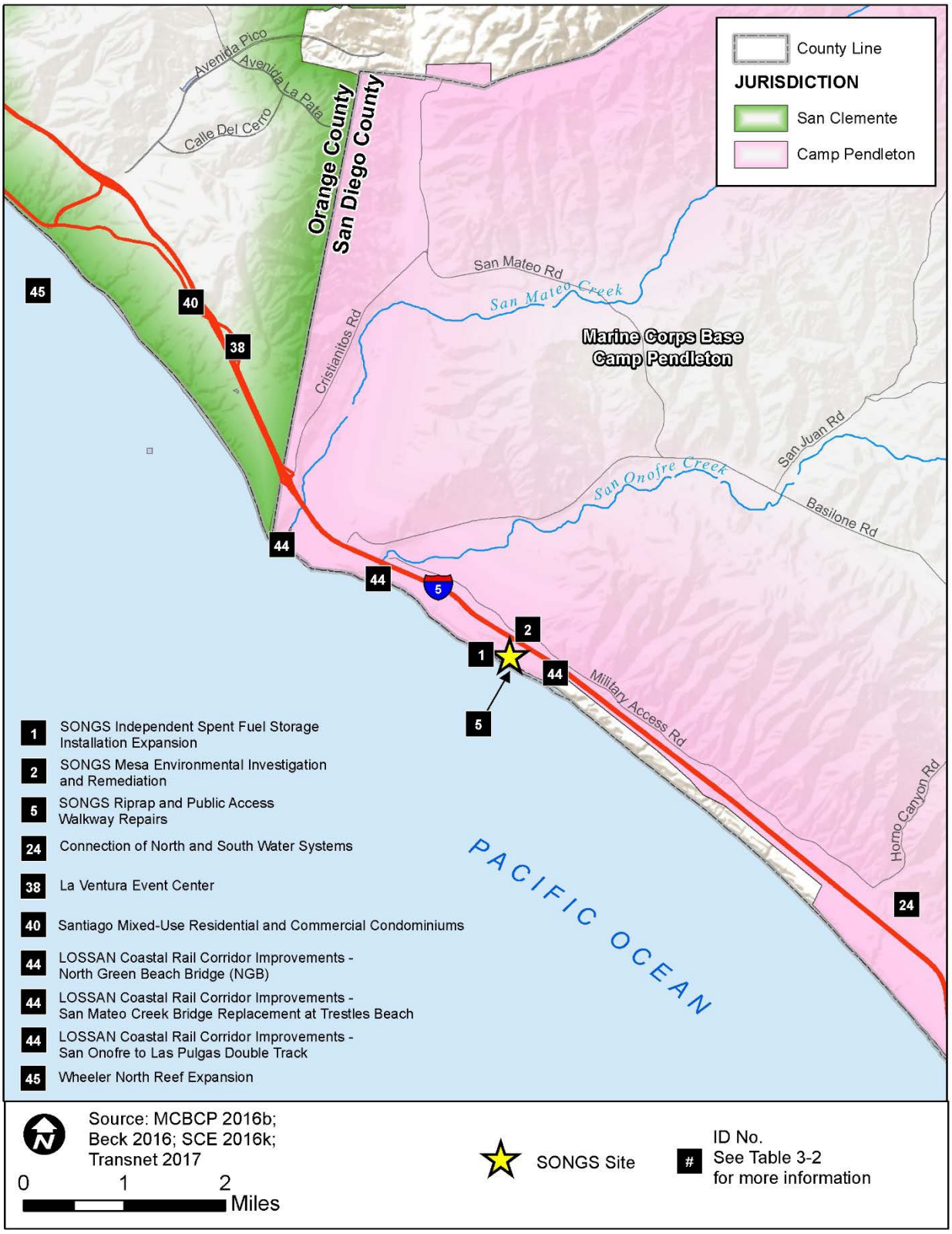
Given that SONGS is located within MCBCP, which is expected to continue to be used for military training purposes for many years in the future, the range of future projects that may be proposed within the geographic scope is limited.

The EIR preparers also examined potential onshore and offshore travel routes that may be used during proposed Decontamination and Dismantlement (D&D) activities to identify potential cumulative projects along these routes. Through input from the adjacent ~~F~~federal and local jurisdictions, as well as through consultation of other previously published CEQA and National Environmental Policy Act (NEPA) documents, numerous projects were included in the cumulative project list. These projects are summarized in Table 3-2 and their locations are shown in Figures 3-1 and 3-2.

Figure 3-1. Marine Barge Route and Nearby Offshore Projects



Figure 3-2. Cumulative Projects Nearest to SONGS



Of the projects described in Table 3-2, six projects that are closely related to the Proposed Project either by their location or by their nature are explained in greater detail below: (1) SONGS Independent Spent Fuel Storage Installation ~~Expansion~~, (2) SONGS Mesa Environmental Investigation and Remediation, (3) Wheeler North Reef Expansion, (4) Palos Verdes Reef Restoration Project, (5) Seawater Desalination Project at Huntington Beach, and (6) Camp Pendleton Seawater Intake Testing Program.

3.2.1 SONGS Independent Spent Fuel Storage Installation ~~Expansion~~

The "Approved ISFSI" component of the Decommissioning Plan includes the ~~expansion of the~~ previously existing Approved ISFSI (AREVA facility), the addition of the Holtec facility, and continued operations and maintenance of the ~~facility~~ Approved ISFSI. In 2000, D&D activities for SONGS Unit 1 included construction of an independent ISFSI on a portion of the SONGS Unit 1 site (AREVA facility) for the temporary storage of spent nuclear fuel (SNF). In 200~~1~~9, Southern California Edison (SCE) obtained approval to ~~construct a larger ISFSI~~ expand the AREVA facility to store SONGS Units 2 and 3 SNF, which was co-located and integrated with the existing Approved ISFSI. As this Approved ISFSI neared full capacity, SCE sought approval from the CCC to further expand the ~~SONGS Units 2 and 3~~ Approved ISFSI by constructing the Holtec facility to accommodate storage in dry casks of all remaining SNF. The 2015 Coastal Development Permit (CDP No. 9-15-0228) conditions require the Participants to return to the CCC in 2035 for a CDP amendment to authorize the retention, removal, or relocation of the Approved ISFSI facility. The ~~expansion~~ Holtec facility portion of the SONGS Approved ISFSI is located adjacent to the existing AREVA facility portion of the ISFSI at the northwest end of the SONGS site in an area once occupied by the Unit 1 reactor. Excavation to a depth of approximately 12 feet above sea level was conducted, followed by the installation of the underground vertical storage modules. Then, the area was built up approximately 12 feet above the current ground level. Construction on this partially below-ground Approved ISFSI facility was completed on January 19, 2018, and brings the number of ~~casks~~ canisters in the ISFSI to a total of 123. The canisters will store the entire inventory of SNF and HLW at the SONGS site. The fuel from the Units 2 and 3 spent fuel pools will be transferred to the ~~expanded~~ Holtec facility portion of the Approved ISFSI through 2019.

3.2.2 SONGS Mesa Environmental Investigation and Remediation

SONGS Mesa is a 135-acre area within MCBCP that is located east of Interstate 5 (I-5). Five parcels within SONGS Mesa have been leased to SCE by the U.S. Department of the Navy (DoN) to accommodate support structures and facilities for SONGS. SCE has determined that it would no longer use three of the Mesa Lease parcels (Parcels 5, 6, and 7) and is in the process of returning these parcels to the DoN pursuant to the lease's cleanup requirements (SCE 2016j). Clean-up and remediation activities on the three Mesa Lease parcels include (CCC 2016a):

- removal of contaminated soil and soil vapor plumes on Parcel 6

- removal of an unused, underground water storage tank in Parcel 5
- collection of additional sample borings and installation of groundwater sampling wells on Parcels 5, 6, and 7

additional future soil remediation work, if required by the California Department of Toxic Substances Control (DTSC), at developed sites within Parcels 5, 6, and 7Currently, DTSC has reviewed SCE's Phase I and II Environmental Site Assessments for the three Mesa Lease parcels. SCE is working with the DTSC to perform additional investigations on the parcels to ensure that the property is in a condition that will allow for unrestricted use by the DoN (SCE 2016j).

In April 2017, the DTSC provided a "No Further Action" letter for Parcel 5A (located west of I-5), which is the entrance to the Mesa lands east of I-5. The No Further Action letter approved the SCE report concluding that Parcel 5A is available for unrestricted use. SCE will continue to use Parcel 5A to access Parcels 6 and 7 until their environmental assessment and any necessary remediation is complete such that DTSC will issue a No Further Action letter for Parcels 6 and 7 (SCE 2018b).

Soil and soil vapor sampling on Mesa Parcels 6 and 7 are continuing to ensure any hazardous constituents on the land are properly delineated. After final delineation and a health risk assessment is prepared, SCE will prepare a remediation plan for DTSC approval. Then, SCE will implement the remediation plan, followed by the DTSC issuance of a No Further Action letter. The anticipated date to return the property to the Navy is June 2021 (SCE 2018b).

3.2.3 Wheeler North Reef Expansion

Wheeler North Reef is a 174-acre artificial kelp reef that was constructed by SCE to comply with the marine mitigation conditions of its Coastal Development Permit for SONGS Units 2 and 3, as required by the CCC (SCE 2016k). In 2012, the CCC concluded that the reef's footprint may be too small to meet the performance standard related to fish biomass (SCE 2016k). The CCC directed SCE to develop a project description and design, engineering, and construction plan for expansion of Wheeler North Reef. The proposed expansion would enlarge the existing reef by about 200 acres. A Notice of Preparation for a Draft Subsequent EIR for this project was issued in January 2018. Project construction is proposed to occur from May 2019 through September 2019.

3.2.4 Palos Verdes Reef Restoration Project

In February 2018, the CSLC adopted a Negative Declaration (ND No. 793, State Clearinghouse No. 2017021066) and authorized a 25-year General Lease – Other to Southern California Marine Institute beginning February 27, 2018, for construction, restoration, enhancement, use, and maintenance of a 69-acre rocky-reef habitat on submerged lands offshore of the City of Rancho Palos Verdes, Los Angeles County (Item

89, February 27, 2018). The National Oceanic and Atmospheric Administration (NOAA) also prepared an Environmental Assessment (EA) for the Project (NOAA 2017b). The project would involve the placement of approximately 70,300 tons of quarried rock on 40 acres of sandy ocean bottom within the 69-acre site. The quarry rock would be transported to the site via tugboat and barge from existing quarries on Catalina Island. Construction would occur between May 1 and September 30, 2018, with an estimated range of 40 to 60 total days of construction (NOAA 2017b).

3.2.5 Seawater Desalination Project at Huntington Beach

In October 2017, the CSLC certified a Supplemental EIR (EIR No. 794, State Clearinghouse No. 2001051092) and authorized the amendment of Lease No. PRC 1980.1, a General Lease – Industrial Use, for the offshore portion of the proposed Poseidon Resources (Surfside) LLC (Poseidon) Seawater Desalination Project at Huntington Beach located at 21730 Newland Street, Huntington Beach, Orange County (Item 97, October 19, 2017). Project elements included: (1) install four wedgewire screen manifolds on the end of the existing seawater intake pipeline; (2) install a multiport seawater diffuser on the end of the existing seawater discharge pipeline; and (3) reduce seawater intake volume to 106.7 million gallons per day (MGD) from the 152 MGD authorized by the CSLC in October 2010 (Item 62, October 29, 2010). Construction for installing the wedgewire screens and outfall diffuser system would take approximately 3 months and 2 months, respectively, with intake and discharge construction potentially overlapping for approximately 2 months. The Project timeline will not be known until Poseidon obtains additional approvals from the Santa Ana Regional Water Quality Control Board, California Coastal Commission, and U.S. Army Corps of Engineers.

3.2.6 Camp Pendleton Seawater Intake Testing Program

The San Diego County Water Authority proposes to construct and operate a temporary seawater desalination intake test facility that would include two intake types to determine the differences in water quality and pre-treatment requirements between the two. The Water Authority is initiating the project to determine the differences in water quality and pre-treatment requirements for a screened (wedgewire) open ocean intake versus a subsurface micro-porous pipe intake. The project site would be located at the MCBCP's southwest corner, near the mouth of the Santa Margarita River and at the northern extent of the Del Mar Beach Resort) Recreational Vehicle Park. The timelines for construction or operation are unknown at this time.

3.2.7 Doheny Ocean Desalination Plant Project

Doheny Ocean Desalination Plant is an ocean water desalination facility proposed in Dana Point. This project would install a subsurface water intake system consisting of subsurface slant wells that would draw in offshore subsurface alluvial material, a water conveyance pipeline, an approximately 10.4 acre 5 to 15 MGD desalination facility, a

concentrate (brine) disposal system, and associated storage and appurtenant facilities. The Draft EIR for this project, which was published on May 18, 2018, anticipates that Phase I would start construction in October 2019, and would be complete by December 2021.

3.2.8 Cumulative Projects List

Cumulative projects are summarized in Table 3-2. See Figures 3-1 and 3-2 (above) for the location of cumulative projects closely related or nearest to SONGS.

Table 3-2. Relevant Cumulative Projects

Project No./Type		Description	Resource(s) that may be Cumulatively Affected													
			HAZ	AES	AQ	BIO	CUL	CRT	GEO	GHG	HYD	LU	NOI	REC	TR	UTIL
Marine Corps Base Camp Pendleton (including SONGS-related projects)																
1	Energy	***SONGS*** *Independent Spent Fuel Storage Installation.* Construction of the Approved ISFSI and continued operations and management, including the transfer of SNF from wet storage. The Approved ISFSI will accommodate the dry storage of all remaining SNF at SONGS. STATUS: Construction completed in January 2018~~7~~. (See Section 1.5.1, *Baseline and Future Conditions*, and Section 3.2.1.)	●	●	●	●	●	●	●	●	●	●	●	●	●	●
2	Hazard Remediation	***SONGS*** *Mesa Environmental Investigation and Remediation.* Clean-up and remediation activities on the three Mesa Lease parcels including removal of contaminated soil and soil vapor plumes; removal of an unused, underground water storage tank; collection of additional sample borings and installation of groundwater sampling wells; and additional future soil remediation work at previously-developed sites if required by DTSC. (See Section 3.2.2.)	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Table 3-2. Relevant Cumulative Projects

Project No./Type		Description	Resource(s) that may be Cumulatively Affected												
			HAZ	AES	AQ	BIO	CUL	CRT	GEO	GHG	HYD	LU	NOI	REC	TR	UTIL
3	Institutional	*New Naval Hospital.* Construction of four-story Naval Hospital facility with three parking structures. STATUS: Finding of No Significant Impact (FONSI) signed January 2010.			●					●						●
4	Maintenance/ Repair	*Recurring Infrastructure and Facility Actions within the Cantonment Areas.* STATUS: Recurring actions categorically excluded from NEPA review or covered under previous NEPA reviews (e.g., Grow the Force Initiative, Basewide Utility Infrastructure, etc.).			●		●	●		●		●			●	
5	Maintenance/ Repair	***SONGS** Riprap and Public Access Walkway Repairs.* Shoreline riprap was moved and restacked higher to provide better walkway support. STATUS: Complete.	●	●	●	●	●	●	●	●	●	●	●	●	●	●
6	Utility Infrastructure	*Camp Pendleton Seawater Desalination Project Intake Testing Program.* Test program on an open intake source and a subsurface intake to compare source water quality and pretreatment requirements. (See Section 3.2.6.)	●		●	●	●	●	●	●	●			●	●	
7	Military Facility	*New Main Exchange and Service Mall.* Construction of Main Exchange, Service Mall, and 580 parking spaces. STATUS: FONSI signed January 2010.		●	●					●						●
8	Military Facility	*MV-22 EA.* Expand the amount of area available to land and operate MV-22 airframe. STATUS: FONSI signed April 2013.			●					●						
9	Military Facility	*Grow the Force Initiative.* Construction of permanent and temporary facilities and infrastructure. STATUS: FONSI signed July 2010. Construction on-going.		●	●		●	●		●		●			●	●

Table 3-2. Relevant Cumulative Projects

Project No./Type		Description	Resource(s) that may be Cumulatively Affected												
			HAZ	AES	AQ	BIO	CUL	CRT	GEO	GHG	HYD	LU	NOI	REC	TR	UTIL
10	Military Facility	*Range 108 Explosive Ordnance Disposal (EOD) Facility.* Construction and operation of new EOD training facility with ordnance library, workshop/tool room, classroom, library, office/kitchen area, two duty rooms (including a locker and showers), restroom, permanent overhead canopy, support facilities, and site improvements. STATUS: FONSI signed March 2013.			●					●						●
11	Military Facility	*P-637 (Range 314) Improvements.* Modernization of an existing live-fire range. STATUS: EA completed. FONSI signed June 25, 2016.			●					●						
12	Military Facility	*Range and Training Areas Maintenance, Repair, and Modification Construction Areas.* Recurring and predictable maintenance, repair, and modification of range and training areas. STATUS: EA in process.			●		●	●		●					●	●
13	Military Facility	*Ground/Air Task Oriented Radar (G/ATOR) Maintenance and Test Support Facility.* Construction of G/ATOR Maintenance and Test Support Facilities at Marine Corps Tactical Systems Support Activity (MCTSSA). STATUS: Construction expected to begin 2018.			●					●						●
14	Military Facility	*Stuart Mesa West Training and Conversion.* Development of new 233-acre training area. STATUS: EA in process.			●		●	●		●						●
15	Military Facility	*MCTSSA Cantonment Area Expansion.* Expansion of existing radar facility by 31 acres. STATUS: FONSI signed September 2014.			●		●	●		●						●

Table 3-2. Relevant Cumulative Projects

Project No./Type		Description	Resource(s) that may be Cumulatively Affected												
			HAZ	AES	AQ	BIO	CUL	CRT	GEO	GHG	HYD	LU	NOI	REC	TR	UTIL
16	Residential	*P-1008.* Construction of marine center, parking lot, and Bachelor Enlisted Quarters. STATUS: FONSI signed September 2012.			●					●						●
17	Residential	*MCBCP Military Family Housing Public-Private Venture.* Construction of 138 military family housing units on 77 acres. STATUS: FONSI published September 2009.			●					●						●
18	Residential	*MCBCP Military Family Housing Public-Private Venture.* Construction of 351 family housing units. STATUS: FONSI published June 2011.			●					●						●
19	Transportation Infrastructure	*I-5 North Coast Corridor Project.* Updates to I-5; addition of high-occupancy vehicle lanes. STATUS: Construction currently underway.	●	●	●	●	●	●		●	●		●		●	●
20	Transportation Infrastructure	*Operations Access Points (P-159) Red Beach.* Construction of bridge, retaining walls, and access roads. STATUS: Second Supplemental EA completed; FONSI signed January 22, 2018.			●		●	●		●					●	
21	Utility Infrastructure	*Advanced Water Treatment Facility/Utility Corridor Project (P-113).* Construction, operation, and maintenance of an advanced water treatment facility and associated infrastructure. STATUS: FONSI signed December 2010; construction currently underway.			●	●			●	●						●

Table 3-2. Relevant Cumulative Projects

Project No./Type		Description	Resource(s) that may be Cumulatively Affected													
			HAZ	AES	AQ	BIO	CUL	CRT	GEO	GHG	HYD	LU	NOI	REC	TR	UTIL
22	Utility Infrastructure	*Basewide Utility Infrastructure.* Construction of new or upgrade of existing utility systems to provide reliable and compliant water, wastewater, natural gas, electrical, and communications systems to support military training, operations, and delivery of life support and quality of life services. STATUS: Construction currently underway.		●	●		●	●		●		●	●		●	●
23	Utility Infrastructure	*Basewide Water Infrastructure.* Construction, operation, and maintenance of infrastructure upgrades, expansions, and improvements on the installation water system and replacement of critical links in the installation roadway system. STATUS: Construction currently underway.		●	●		●	●		●	●	●	●		●	●
24	Utility Infrastructure	*Connection of North and South Water Systems.* Construction of 90,000 feet of potable water lines beneath Santa Margarita River and San Onofre Creek to connect north and south water systems. STATUS: Record of Decision issued in 2012.			●		●	●		●	●	●				
CITY OF CARLSBAD																
25	Maintenance/ Repair	Agua Hedionda Routine Maintenance Dredging. Emergency and routine channel work.			●	●	●	●	●	●	●					
26	Mixed Use	*Marja Acres.* Specific plan for residential, commercial, and community areas. STATUS: Under review.			●					●						

Table 3-2. Relevant Cumulative Projects

Project No./Type		Description	Resource(s) that may be Cumulatively Affected												
			HAZ	AES	AQ	BIO	CUL	CRT	GEO	GHG	HYD	LU	NOI	REC	TR	UTIL
27	Mixed Use	*The Preserve Master Plan.* Construction of 636 new homes, townhomes, apartments, several parks, playgrounds, pet play areas, hiking trail connections, exercise facility, spa, swimmer's lap pool, and a children's wading pool. STATUS: Construction ongoing.			●					●						
28	Utility Infrastructure	*Buena Outfall Force Main.* Construction of sewer pipeline and appurtenances within coastal zone.	●		●	●	●	●	●	●	●			●	●	
CITY OF DANA POINT																
29	Commercial	*Dana Point Harbor Revitalization.* Replacement/relocation of existing retail and restaurant uses. Construction of new lighthouse facility. Addition of 25,000-square-feet of retail and restaurant uses, a festival plaza, and 610-space parking deck. STATUS: Entitlements only to date.			●					●						●
30	Mixed Use	*Dana Point Town Center/Lantern.* Net increase of 192,165-square-feet of retail/restaurant use, 31,224-square-feet of office use, 50,000-square-feet of institutional use, and 237 residential units. STATUS: Under construction.			●					●						●
31	Residential	*Melrose Heights.* Construction of 313 residential units.			●					●						●
32		Opportunistic Beach Fill Program Provides beach nourishment at Baby Beach in Dana Point Harbor and Capistrano Beach County Park. 65,0000 cubic yards was added in the spring of 2016. STATUS: Periodic, ongoing.			●	●			●	●	●		●			

Table 3-2. Relevant Cumulative Projects

Project No./Type		Description	Resource(s) that may be Cumulatively Affected												
			HAZ	AES	AQ	BIO	CUL	CRT	GEO	GHG	HYD	LU	NOI	REC	TR	UTIL
CITY OF OCEANSIDE																
33	Utility Infrastructure	San Diego Gas & Electric (SDG&E) Substation. STATUS: Pending application.			●					●						
34	Mixed Use	*GF Properties, Mixed-use Project.* Construction of 231 residential units, a 150-room hotel, and a 38,000-square foot commercial space. STATUS: Approved.			●		●	●		●						●
35	Commercial	*Beach Resort Hotel.* Construction of 389-room hotel, 18,500-square-feet of commercial space, a 20,000-square-foot meeting/function space, and a 6,400-square-foot ballroom. STATUS: Under construction.			●		●	●		●						●
36	Residential	*The Strand.* Construction of 25 condominium units, 10 single-family residences, and seawall improvements. STATUS: Under construction.			●		●	●		●	●					●
37	Maintenance/ Repair	Opportunistic Beach Fill Program. STATUS: Under review.			●	●			●	●	●		●			
CITY OF SAN CLEMENTE																
38	Commercial	*La Ventura Event Center.* Construction of new event center. STATUS: Approved.			●					●						●
39	Mixed Use	*Marblehead Coastal.* Master Land Use Plan designed to include about 640,000-square-feet of retail use, a visitor-service commercial site, and two residential single-family neighborhoods. STATUS: Under Construction.			●			●		●						●
40	Mixed Use	*Santiago Mixed-Use Residential and Commercial Condominiums.* Construction of three commercial suites and seven residential units. STATUS: Approved.			●			●		●						●

Table 3-2. Relevant Cumulative Projects

Project No./Type		Description	Resource(s) that may be Cumulatively Affected													
			HAZ	AES	AQ	BIO	CUL	CRT	GEO	GHG	HYD	LU	NOI	REC	TR	UTIL
41	Maintenance/ Repair	*San Clemente Beach Replenishment Project.* Periodic beach replenishment about every 6 years over a 50-year project life. Linda Lane to South T Street beaches). STATUS: Periodic, ongoing.			●	●			●	●	●		●			
NORTH COUNTY TRANSIT DISTRICT																
42	Transportation Infrastructure	North County Transit District Scripps Miramar Ranch Bridge Replacement and Second Track Project. Replacement of railroad bridge and construction of second track bridge. STATUS: EA prepared.	●		●		●	●	●	●	●					
43	Transportation Infrastructure	*Camp Pendleton COASTER Transit Center.* New COASTER train station within Camp Pendleton. STAUS: In planning phase.	●	●	●		●	●		●					●	
44	Transportation Infrastructure	*LOSSAN Coastal Rail Corridor Improvements.* Multiple projects are planned or have been recently completed to improve this rail corridor, including bridge replacements, new track installation, and track realignments. Improvements closest to SONGS include: • San Mateo Creek Bridge Replacement at Trestles Beach. STATUS: Completed Feb. 2012. • North Green Beach Bridge. STATUS: Completed Dec. 2017. • San Onofre to Pulgas Double Track Stage 2. STATUS: Under design.	●	●	●	●	●	●		●	●	●	●		●	

Table 3-2. Relevant Cumulative Projects

Project No./Type		Description	Resource(s) that may be Cumulatively Affected													
			HAZ	AES	AQ	BIO	CUL	CRT	GEO	GHG	HYD	LU	NOI	REC	TR	UTIL
Offshore Cumulative Regional and Marine Transit Projects																
45	Artificial Reef (Mitigation)	*Wheeler North Reef Expansion.* Expansion of the existing Wheeler North Reef as required to comply with California Coastal Commission (CCC) permit conditions. STATUS: CSLC released a Notice of Preparation of a Subsequent EIR in January 2018. (See Section 3.2.3.)	●	●	●	●	●			●	●			●	●	
46	Artificial Reef (Restoration)	*Palos Verdes Reef Restoration Project.* Restoration of historic rocky reef habitat offshore city of Rancho Palos Verdes, Orange County. STATUS: CSLC adopted Negative Declaration in February 2018. Proposes 40 to 60 days of construction to complete project between May 1 and September 30, 2018. (See Section 3.2.4.)	●	●	●	●	●			●	●			●	●	
47	Outfall/Intake Modifications	Seawater Desalination Project at Huntington Beach: Outfall/Intake Modifications and General Lease – Industrial Use (PRC 1980.1) Amendment (Poseidon Huntington Beach). Modification to the offshore intake and discharge pipelines offshore Huntington Beach. STATUS: CSLC certified Supplemental EIR in October 2017. Subsequent actions by Regional Water Quality Control Board, CCC, and other agencies pending.	●	●	●	●				●	●			●	●	
48	Offshore modifications	Cabrillo Power I LLC Encina Marine Oil Terminal Decommissioning Project. Marine transport of construction equipment round trips between Port of Long Beach and southward. STATUS: Decommissioning in progress.	●	●	●	●				●	●			●	●	

Table 3-2. Relevant Cumulative Projects

Project No./Type		Description	Resource(s) that may be Cumulatively Affected												
			HAZ	AES	AQ	BIO	CUL	CRT	GEO	GHG	HYD	LU	NOI	REC	TR	UTIL
49	Beach Oil Well Remediation	*Becker and Legacy Wells Abandonment and Remediation Project.* Abandon leaking oil well on Summerland Beach, Santa Barbara County requiring marine transport of construction equipment round trips between Port of Long Beach and site. STATUS: **Completed March 1, 2018.**			●					●						
50	Port	Port of Los Angeles Berth Improvement Projects. STATUS: Ongoing berth improvement projects			●					●					●	
51	Port	*Port of Long Beach Middle Harbor Redevelopment Project and Pier G Modernization.* STATUS: Current phase is renovating Pier F container terminal, filling an additional 40 acres of harbor, and expanding the on-dock rail yard from 10,000 to 75,000 linear feet			●					●					●	
52	Utility Infrastructure	Doheny Ocean Desalination Plant. Construct a facility with an initial capacity of up to 5 MGD, with potential for future expansions up to 15 MGD. STATUS: The Draft EIR was published May 17, 2018.	●	●	●	●				●	●			●	●	●

Sources: Battista 2016; Battista 2018; Beck 2016; CCC 2016a; City of Carlsbad 2016; City of Oceanside 2016b; Greenbauer 2016; MCBCP 2016b; SCE-AM 2017; SCE 2016j; Nelson 2016; Neu 2016; North County Transit District 2017; NOAA 2017b; Smith 2016; Stokes 2016; Transnet 2017; USACE 2014; Dana Point Times 2016, South Coast Water District (SCWD) 2018.

Notes: [1] Numbers correspond to locations shown on Figure 3-2.

Acronyms: HAZ = Hazardous and Radiological Materials AES = Aesthetics; AQ = Air Quality; BIO = Biological Resources; CUL = Cultural and Paleontological Resources; CRT = Cultural Resources–Tribal; GEO = Geology, Soils, and Coastal Processes; GHG = Greenhouse Gas Emissions; HYD = Hydrology and Water Quality; LU = Land Use and Planning; NOI = Noise; REC = Recreation and Public Access; TR = Transportation and Traffic; UTIL = Utilities and Public Service Systems

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4.0 ENVIRONMENTAL IMPACT ANALYSIS

INTRODUCTION

As noted in Section 1.0, *Introduction*, of this Environmental Impact Report (EIR), Southern California Edison Company (SCE), San Diego Gas & Electric Company, and the cities of Riverside and Anaheim (collectively, Participants) plan to decommission the San Onofre Nuclear Generating Station (SONGS) to address U.S. Nuclear Regulatory Commission (NRC) and landowner requirements (hereinafter referred to as SONGS Decommissioning Plan). The SONGS Decommissioning Plan has three components:

- **Approved Independent Spent Fuel Storage Installation (Approved ISFSI) ~~Expansion,~~ Operation~~,~~ and Maintenance (2015 through 2035)** (In 2015, the California Coastal Commission [CCC] approved Coastal Development Permit [CDP] No. 9-15-0228 to ~~expand the existing~~ construct the Holtec facility adjacent to the existing AREVA facility portion of the ISFSI to accommodate all remaining spent nuclear fuel [SNF] at SONGS and to require the Participants to return to the CCC in 2035 to amend the CDP to authorize the retention, removal, or relocation of the ISFSI.)
- **Proposed Project – Decontamination and Dismantlement and ~~Conduit Disposition~~ CSLC Lease Offshore Activities (2019 through 2028)** (the project – as defined in California Environmental Quality Act [CEQA], § 21065 and State CEQA Guidelines, § 15378 – that is analyzed in this EIR)
- **Future Activities (~2035)** (These activities are not part of the Proposed Project. See *Timing of Proposed Project Elements and Future Activities*, below.)

In Section 4 of this EIR, the California State Lands Commission (Commission or CSLC), as lead agency under the California Environmental Quality Act (CEQA), discloses and analyses the potential significant environmental impacts of the Proposed Project. Table 4-1 lists the environmental issues evaluated in Section 4.

Table 4-1. Environmental Issues

Analyzed in this EIR (by Section Number)	
4.1 Hazardous and Radiological Materials	4.9 Hydrology and Water Quality
4.2 Aesthetics	4.10 Land Use and Planning
4.3 Air Quality	4.11 Noise
4.4 Biological Resources	4.12 Recreation and Public Access
4.5 Cultural and Paleontological Resources	4.13 Transportation and Traffic
4.6 Cultural Resources – Tribal	4.14 Utilities and Public Service Systems
4.7 Geology, Soils, and Coastal Processes	
4.8 Greenhouse Gas Emissions	
Not Analyzed in this EIR (see discussion below)	
• Agriculture and Forestry Resources	• Population and Housing
• Mineral Resources	• Energy

Each environmental issue analyzed in this EIR describes the existing environmental setting (i.e., baseline conditions prior to Proposed Project implementation) and defines the relationship between baseline conditions and Proposed Project-related impacts. Information sources include: (1) the NRC (2002) *Final Generic Environmental Impact Statement (GEIS) on Decommissioning of Nuclear Facilities Supplement* (NUREG-0586), which analyzed environmental impacts of decommissioning U.S. nuclear power plants (see www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr0586/) and other reports, studies, or planning documents prepared by or for other agencies (e.g., San Diego County, San Diego Air Pollution Control District, CSLC, California Coastal Commission, California Department of Fish and Wildlife, National Oceanic and Atmospheric Administration, U.S. Fish and Wildlife Service, and U.S. Geological Survey [USGS]); peer-reviewed articles; and Geographic Information System data.

Each section also describes the approach used to analyze impacts, determines the significance of each identified impact, and recommends mitigation measures (MMs) if feasible to reduce or avoid the Proposed Project's significant impacts. Throughout Section 4.0, numbered statements are used to identify impacts, and MMs are numbered to correspond to the impacts they address (e.g., Impact AQ-1; MMs AQ-1a and AQ-1b).

TIMING OF PROPOSED PROJECT ELEMENTS AND FUTURE ACTIVITIES

Uncertainties exist with respect to the overall SONGS Decommissioning Plan initiation and timing. As part of the Proposed Project, the Participants plan to begin onshore Decontamination and Dismantlement activities and offshore decommissioning of the Units 2 and 3 seawater intake and discharge conduits (see Table 2-1, *Proposed SONGS Decommissioning Plan (Detailed)*). Remaining components of the SONGS Decommissioning Plan (Future Activities) would be implemented through 2035. As described in Section 1.5.2, *Uncertainty Regarding Future Decommissioning Plan Activities*, some aspects of SONGS Decommissioning Plan that would occur many years in the future, as well as actions dependent on approvals from other federal agencies that have not yet been granted, are not defined at this time. These "Future Activities" are disclosed in this EIR based on the best available information to date or using reasonable assumptions as to the activities required; however, the level of analyses of the impacts of such activities is limited. This is consistent with the State CEQA Guidelines, which states:

- Drafting an EIR … necessarily involves some degree of forecasting. While foreseeing the unforeseeable is not possible, an agency must use its best efforts to find out and disclose all that it reasonably can. (§ 15144)
- If, after thorough investigation, a Lead Agency finds that a particular impact is too speculative for evaluation, the agency should note its conclusion and terminate discussion of the impact. (§ 15145)

In *Laurel Heights Improvement Association v. Regents of the University of California* (1988) 47 Cal. 3d 376, the California Supreme Court commented that an agency is required to forecast only to the extent that an activity could be reasonably expected under the circumstances. An agency cannot be expected to predict the future course of governmental regulation or exactly what information scientific advances may ultimately reveal. The court also noted that where future development is unspecified and uncertain, no purpose can be served by requiring an EIR to engage in sheer speculation as to future environmental consequences. These Future Activities would require future review under the California Coastal Act (Pub. Resources Code, § 30000 et seq.), CEQA, or the National Environmental Policy Act.

NO IMPACTS / NO SIGNIFICANT IMPACTS

Based on an initial review and analysis, the Proposed Project would have no impact or a less-than-significant impact on certain environmental issues. Reasons why no significant impacts are expected related to these issues, which are not reviewed in this EIR, are discussed below as required pursuant to State CEQA Guidelines section 15128.

Agriculture and Forestry Resources

The onshore SONGS site lies entirely within the boundaries of the Marine Corps Base Camp Pendleton (MCBCP), and offshore facilities are located on land leased from the CSLC. The Proposed Project site is delineated by the California Department of Conservation (2014a, b, c) as Urban and Built-Up Land or Other Land with no designated Farmland or forest land and, according to Department of Conservation agricultural conservation maps, no lands enrolled in a Williamson Act contract within 5 miles of SONGS, and no agricultural or forested lands expected to be directly or indirectly affected by SONGS Decommissioning Plan activities. The Proposed Project would have no impact on agriculture or forestry resources because it would not:

- Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance
- Conflict with existing zoning for agricultural use, or a Williamson Act contract
- Conflict with existing zoning for, or cause rezoning of, forest land, timberland, or timberland zoned Timberland Production
- Result in the loss of forest land or conversion of forest land to non-forest use
- Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use.

Mineral Resources

According to the Mineral Resource Data System (USGS 2017a), no known mineral resources are on or in the immediate area of the Proposed Project site. The nearest

mineral resources are at the San Clemente Project in San Clemente. Therefore, the Proposed Project would have no impact on mineral resources because it would not result in the loss of availability of (1) a known mineral resource that would be of value to the region and the residents of the State or (2) a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan.

Population and Housing

Proposed Project activities would be performed by an estimated peak workforce of 100 SONGS personnel and 570 Decommissioning General Contractor (DGC) personnel, which is less than the approximately 750 people who currently work on-site. The workforce would largely be from the local area. Workers from outside the local area would likely stay in rental housing in San Clemente, Oceanside, or other nearby communities. This would indirectly increase activity in local retail establishments if construction workers patronize local establishments but would not significantly increase the population in the area, induce employment, or displace local businesses or homes. Upon completion of the SONGS Decommissioning Plan, the site would be retained under federal control within the MCBCP. Therefore, the Proposed Project would have no significant impact on population and housing or indirect growth-inducing impacts because it would not:

- Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)
- Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere
- Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere.

Energy

Appendix F of the State CEQA Guidelines requires that EIRs discuss the potential energy impacts of proposed projects to ensure that energy implications are considered in project-related decision-making processes. Based on Appendix F guidance for evaluating whether a project may generate significant impacts with regard to energy conservation, a project could have a significant impact if the project would use large amounts of fuel or energy in an unnecessary, wasteful, or inefficient manner. Proposed Project activities would consume primarily diesel fuel with comparably negligible consumption of gasoline, natural gas, or electricity. Diesel fuel would be consumed by trucks, locomotives, and marine vessels transporting decommissioned debris; and off-road and marine equipment used in the onshore and offshore demolition activities. As shown in Table 4.8-2 (see Section 4.8, *Greenhouse Gas Emissions*) the Proposed Project would emit approximately ~~48,828~~45,168 metric tons of carbon dioxide equivalent (CO_2e). These emissions are equivalent to ~~4.74~~4.38 million gallons of diesel consumed during the Proposed Project's

estimated 7-year decommissioning phase (using an energy conversion factor for diesel of 10.30 kilograms/gallon [The Climate Registry 2017]). No alternative methods exist to dispose of decommissioning debris that would consume less energy. The proposed diesel petroleum use would equate to only ~~0.022~~0.020 percent of the approximately 21 billion gallons of diesel petroleum that would be consumed statewide during the 7-year decommissioning period (based on 2016 state data showing taxable diesel sales of 3 billion gallons per year [California Department of Tax and Fee Administration 2018]). Given these considerations, petroleum consumption associated with the Proposed Project is not considered inefficient or wasteful.

ASSESSMENT METHODOLOGY

Environmental Baseline and Setting

The Proposed Project area includes the U.S. Department of Navy (DoN) easement area for the SONGS Units 2 and 3 onshore facilities, the CSLC lease area for the offshore components, and adjacent areas where impacts from Proposed Project activities could reasonably be expected. Baseline conditions within this area are defined as the existing physical environmental setting by which a lead agency determines whether an impact is significant. (State CEQA Guidelines, § 15125, subd. (a). See Section 1.5.1, *Baseline and Future Conditions*, for a discussion of the Proposed Project's baseline.) A significant environmental effect or impact is defined as a substantial or potentially substantial adverse change in the environment." (Pub. Resources Code, §§ 21068, 21100, subd. (d); State CEQA Guidelines, § 15358.) The impact analysis in this EIR examines the changes in the environment resulting from the decommissioning of the current non-operational facility, as proposed by the Participants in accordance with NRC requirements.

Baseline conditions for the analysis of potential significant impacts of the Proposed Project include the following activities that the NRC or CCC already approved (see Section 1.5.1, *Baseline and Future Conditions* and Section 2.2.2, *Existing Project Setting (Approved and Completed Activities*):

- Siting, ~~and~~ expansion, construction, operation, and maintenance of the Approved ISFSI
- Storage of SNF and other high-level radioactive waste (HLW) at SONGS until 2035
- Other activities associated with SONGS decommissioning, such as Cold & Dark Modifications (see Table 2-4 in Section 2.2.2.2, *Ongoing Maintenance, Hazard Elimination, and Preparatory Activities*), that have already occurred or would be completed before initiation of Proposed Project activities

Regulatory Setting

Each environmental issue is considered in terms of federal, state, regional, and local laws, regulations, and policies applicable to the issue. Appendix A summarizes applicable federal and state laws, regulations, and policies; applicable regional and local laws, regulations, and policies are identified in each environmental issue section. (See also Table 4.1-1 and Section 1.2.1, *Legal and Governmental Authority: Federal* for a summary of federal responsibilities, including federal preemption, related to nuclear power plants.)

Significance Criteria

Significance criteria are identified for each environmental issue. These criteria serve as benchmarks for determining if a Proposed Project component or activity would result in significant adverse environmental impacts when evaluated against baseline conditions. A significant effect on the environment means "a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project…." (State CEQA Guidelines, § 15382.) Significance criteria relevant to each section are drawn from a variety of sources, including Appendix G of the State CEQA Guidelines and applicable local regulatory agency policies and standards indicated within each section. Some impact categories in this EIR lend themselves to scientific or mathematical analysis and quantification, while others are more qualitative. Some issues, such as air quality, have significance thresholds established by agencies with regulatory authority for that resource. Significance criteria selection and the determination of impact significance are based on the independent judgment of the CSLC as CEQA lead agency.

Impact Analysis

The terms "effect" and "impact" used in this document are synonymous and can refer to effects that are either adverse or beneficial.

Direct effects	Effects caused by the Proposed Project that occur at the same time and place as the Proposed Project
Indirect effects	Effects caused by the Proposed Project that occur later in time, or further in distance, but are still reasonably foreseeable
Residual impacts	Impacts that still meet or exceed significance criteria after application of mitigation and, therefore, remain significant
Cumulative impacts	Impacts resulting from the Proposed Project when combined with similar effects of other past, present, and reasonably foreseeable future projects, regardless of which agency or person undertakes such projects (cumulative impacts could result from individually insignificant but collectively significant actions taking place over time)
Short-term impacts	Impacts expected to occur during decommissioning that do not have lingering effects for an extended period after decommissioning is completed
Long-term impacts	Impacts that would persist for an extended period, including after completion of decommissioning

The significance of the impact is determined based on an analysis of the impact, compliance with any recommended MMs, and the level of impact remaining compared to the applicable significance criteria. Impacts are classified as one of the five categories listed below.

Significant and Unavoidable	A substantial or potentially substantial adverse change from the environmental baseline that meets or exceeds significance criteria, where either no feasible mitigation can be implemented, or the impact remains significant after implementation of mitigation measures
Less than Significant with Mitigation	A substantial or potentially substantial adverse change from the environmental baseline that can be avoided or reduced to below applicable significance thresholds
Less than Significant	An adverse impact that does not meet or exceed the significance criteria of a particular environmental issue area and, therefore, does not require mitigation
Beneficial	An impact that would result in an improvement to the physical environment relative to baseline conditions
No Impact	A change associated with the Project that would not result in an impact to the physical environment relative to baseline conditions

The analysis in this EIR is prepared with the understanding that the Participants would obtain all required permits and approvals from other agencies and comply with all legally applicable terms and conditions associated with those permits and approvals. In addition, the laws, regulations, and standards for decommissioning a nuclear generating facility would be applied consistently to the Proposed Project. Implementation of the Project, which is described in Section 2.0, *Project Description*, including implementation of MMs identified to reduce or avoid significant adverse impacts, would be monitored in accordance with a Mitigation Monitoring Program (MMP) (summarized below).

Mitigation, Applicant Proposed Measures, and Mitigation Monitoring Program

An EIR is required to indicate the way any significant effects on the environment of a project can be mitigated or avoided; a governmental agency must prevent significant, avoidable damage to the environment by requiring changes in projects through the use of alternatives (discussed below) or MMs when the agency finds the changes to be feasible. (CEQA, § 21002.1, subd. (a) & (b); State CEQA Guidelines, § 15002, subd. (a).) Implementation of multiple MMs may be needed to reduce an impact to a less-than-significant level. Impacts that still meet or exceed significance criteria after application of MMs are considered residual impacts that remain significant. An applicant may also propose measures that when implemented would reduce potential impacts; this EIR refers to such measures as “Applicant-proposed measures” (APMs). SCE commits to implementing the APMs listed in Table 4-2 below.

Table 4-2. Applicant-Proposed Measures

Applicant-Proposed Measure	Potential Impact Area
APM-1: Waste Management Program	Hazardous and Radiological Materials Biological Resources Hydrology and Water Quality Recreation and Public Access
APM-2: Hazardous Materials Business Plan	Hazardous and Radiological Materials Hydrology and Water Quality
APM-3: Vehicle Emission Reductions	Air Quality
APM-4: Dust Suppression	Air Quality Hazardous and Radiological Materials Hydrology and Water Quality
APM-5: Vehicle Speeds	Air Quality
APM-6: Track-Out to Public Streets	Air Quality
APM-7: Tarping Trucks	Air Quality
APM-8: Nesting Bird Deterrents	Biological Resources
APM-9: Conduit Work Plan	Biological Resources
APM-10: Cultural Resources Protection	Cultural Resources
APM-11: Appropriate Treatment of Human Remains	Cultural Resources
APM-12: Stormwater Pollution Prevention Plan (SWPPP)	Hydrology and Water Quality Hazardous and Radiological Materials Biological Resources
APM-13: Spill Prevention Control and Countermeasure (SPCC) Plan	Hydrology and Water Quality Hazardous and Radiological Materials
APM-14: Spill Contingency Plan	Hydrology and Water Quality Hazardous and Radiological Materials
APM-15: Dredging Plan	Hydrology and Water Quality Biological Resources Transportation and Traffic
APM-16: Turbidity Monitoring	Hydrology and Water Quality Biological Resources
APM-17: Offshore Spill Response Plan	Hydrology and Water Quality Biological Resources
APM-18: Notification to Local Mariners	Recreation and Public Access Transportation and Traffic
APM-19: Emergency Services Access	Transportation and Traffic
APM-20: Oversize/Overweight Loads	Transportation and Traffic
APM-21: Pedestrian and Bicycle Access and Safety	Transportation and Traffic
APM-22: Private Aids to Navigation	Transportation and Traffic

Under CEQA, the lead agency must adopt a reporting or monitoring program for any changes made to the project or conditions of project approval adopted to mitigate or avoid significant effects on the environment (i.e., MMP). (CEQA, § 21081.6, subd. (a)(1).) The

impact sections throughout Section 4.0, and Section 7.0, *Mitigation Monitoring Program*, identify all MMs and APMs to reduce significant impacts. All MMs and APMs included in a CSLC-adopted MMP become lease conditions. The CSLC or its designee would ensure implementation of all MMs and APMs.

Cumulative Impacts Analysis

An EIR must discuss the cumulative impacts of a project when that project's incremental effect is "cumulatively considerable." (State CEQA Guidelines, § 15130.) A cumulative impact is an impact created through a combination of the project and other projects that cause similar impacts. Section 3.0, *Cumulative Projects*, defines the applicable geographic scope of the cumulative analysis, and lists closely related projects to be included in the cumulative environment. The impact analysis for cumulative impacts is presented at the end of each environmental issue section within Section 4.0, *Environmental Impact Analysis* (e.g., at the end of Section 4.1, *Hazardous and Radiological Materials*, Section 4.2, *Aesthetics*, etc.).

Impacts of Alternatives

Pursuant to State CEQA Guidelines section 15126.6, an EIR must describe and evaluate a range of reasonable alternatives that would feasibly attain most of the project's basic objectives and would avoid or substantially lessen any of the significant impacts of the project as proposed. The range of alternatives is governed by the "rule of reason," that is, an EIR needs to describe and evaluate only those alternatives necessary to permit a reasoned choice and to foster informed decision making and public participation. (State CEQA Guidelines, § 15126.6, subd. (f).) Section 5.0, *Project Alternatives Analysis*, describes alternatives to the Proposed Project and includes the impact analysis for each alternative scenario considered. A summary of the alternatives analysis is also included in Section 6.0, *Other Required CEQA Sections and Environmentally Superior Alternative*.

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4.1 HAZARDOUS AND RADIOLOGICAL MATERIALS

The U.S. Nuclear Regulatory Commission's (NRC's) exclusive jurisdiction over the radiological aspects of decommissioning[23] preempts states from imposing any regulatory requirements related to radiation hazards or nuclear safety. (See *Pacific Gas and Electric Company v. State Energy Commission*, 461 U.S. 190, 103 S.Ct. 1713 (1983).) The NRC governs the entire decommissioning process, including cleanup or removal of radioactively contaminated plant structures and systems, removal and interim storage of the radioactive fuel (SNF) and high-level radioactive waste (HLW) on site, and oversight throughout decommissioning. The California State Lands Commission (Commission or CSLC) is subject to this "federal preemption" over issues concerning the handling, storage, transport, disposal, and monitoring of SNF and HLW. (See also Table 4.1-1 and Section 1.2.1, *Legal and Governmental Authority: Federal*.) Additionally, as lead agency under CEQA, the CSLC is required to consider "the whole of [the] action" in reviewing the Proposed Project, including aspects of the Proposed Project that are outside of CSLC's jurisdiction, such as the radiological aspects of decommissioning (State CEQA Guidelines, § 15378) (see Section 1.4.1, *Project Context with Respect to CEQA*). Therefore, in this section the EIR discloses and describes NRC review and analysis of plant decommissioning and SNF storage processes, as well as documents produced by NRC and SCE that govern and structure decommissioning of SONGS. With the assistance of a third-party environmental consulting firm,[24] and with peer review of CSLC staff, CSLC has conducted an independent review and analysis of these and other relevant sources in analyzing potential impacts of the Proposed Project.

This section of the Environmental Impact Report (EIR) describes existing conditions relative to radiological and other hazardous materials associated with the decontamination and dismantlement (D&D) by Southern California Edison (SCE) and its partners (collectively, Participants) of San Onofre Nuclear Generating Station (SONGS) Units 2 and 3 (Proposed Project). The onsite structures, systems, and components (SSCs) to be decommissioned that are discussed in this section are described in detail in Section 2.0, *Project Description*. This section also identifies applicable significance thresholds, assesses the Proposed Project's environmental effects and their significance, and recommends measures, often in accordance with NRC requirements, to avoid or substantially reduce any effects found to be potentially significant. The DoN-owned land where Proposed Project decommissioning-related work would occur includes an approximately 84-acre easement for the primary nuclear facilities (DoN Easement); two leased parcels adjacent to the DoN Easement, including parking lots and laydown/storage

[23] Pursuant to NRC regulations (10 Code of Federal Regulations [CFR] Part 50.2) decommissioning means "to remove a facility or site safely from service and reduce residual radioactivity to a level that permits: (1) Release of the property for unrestricted use and termination of the license; or (2) Release of the property under restricted conditions and termination of the license."

[24] This document has been prepared for the California State Lands Commission by Aspen Environmental Group under Contract No. C2015046.

land comprising approximately 15 acres; and easements for an access road and rail spur (Onshore Site). The 21 acres of tide and submerged lands in the Pacific Ocean, southwest of the Onshore Site (Offshore Site), includes the majority of the CSLC Lease Facilities area. The geographic scope of this EIR covers activities proposed onshore at the SONGS site (outside of CSLC jurisdiction) and offshore on tide and submerged lands leased from the CSLC pursuant to Lease PRC 6785.1 (the CSLC Lease Facilities within CSLC jurisdiction).

Table 4.1-1. NRC's Authority over Nuclear Hazards and Hazardous Materials

Release of Property and Equipment
Following the industry practice described in NRC Inspection and Enforcement (I&E) Circular 81-07 (NRC 1981) presumes compliance with Governor Executive Order No. D-62-22 (California Office of Governor 2002), which established a moratorium on in-state disposal of decommissioning wastes in California (see Section 2.3.8, Decommissioning Waste Volumes and Disposal Sites), for unrestricted release of equipment and material in California at the actual Minimum Detectable Activity (MDA), as long as the MDA is at or below the described levels. However, there cannot be any recycling of decommissioning material within California, regardless of the level of radioactivity (if any). NRC (2016c) refers to NUREG-1757, Volume 2, Revision 1, for tables of screening criteria (concentrations) applicable to surface contamination of buildings and to surface soils (Tables H.1 and H.2).
Release of Potentially Contaminated Volumetric Material
NUREG-1757, Vol. 2 Revision 1 states that Reactor licensees (10 CFR Part 50 licensees) may release equipment and building structure deconstruction and dismantlement materials in accordance with guidance in I&E Circular 81-07, Information Notice 85-92, and Information Notice 88-22 (NRC 2016c). Per SCE information (SCE 2016a – Data Request [DR] #1-129), there is about five times more by weight non-radioactive debris and metal than that considered radioactive. The basis for this claim is substantiated through their process knowledge of the site; however, no DCGL is established and certain survey work may be at risk. I&E Circular 81-07 (NRC 1981) pertains to acceptable use and capability of survey monitoring equipment and is described above. Information Notice 85-92 (NRC 1985) supplements the guidance of I&E circular 81-07 as it applies to surveys of solid waste materials before disposal from nuclear reactor facilities. "…care should be taken to ensure that no licensed radioactive material is released contrary to the provisions of [former] provision 10 CFR Part 20.301. In practice, no radioactive (licensed) material means no detectable radioactive material." The Notice continues to say, "Careful surveys, using methods (equipment and techniques) for detecting very low levels of radioactivity, are made of materials that may be contaminated and that are to be disposed of as clean waste. These survey methods should provide licensees with reasonable assurance that licensed material is not being released from their control." (Although this notice was written in the context of former CFR provisions, it continues to apply to corresponding current CFR provisions.) Information Notice 88-22 (NRC 1988b) instructs reactor licensees to apply in accordance with the provisions of former provision 10 CFR Part 20.302 (current provision 10 CFR Part 20.2002) to dispose of sewage sludge containing very low levels of licensed radioactive material in a manner not otherwise authorized in the regulations. Applications for approval of such disposal may be made to NRC or Agreement State, as appropriate. Surveys are required before

Table 4.1-1. NRC's Authority over Nuclear Hazards and Hazardous Materials

disposing of sewage treatment sludge, to determine if the sludge is contaminated. Gamma-ray spectrometry is recommended on representative samples of the sludge under conditions that provide a Lower Limit of Detection (LLD) appropriate to measurements of environmental samples. Such measurements make it possible to distinguish licensed material from other radioactive materials (natural radioactive materials and worldwide fallout) that may be present in the sludge.
Exposure Limits
See Section 4.1.1.3, *Radiation Exposure*, and Table 4.1-3 for discussion of NRC regulations on occupational and public radiation exposure limits.
License Termination Rule (LTR)
A site will be considered acceptable for unrestricted use if the residual radioactivity that is distinguishable from background radiation results in a TEDE to an average member of the critical group that does not exceed 25 mrem per year, including from groundwater sources of drinking water, and the residual radioactivity is reduced to levels that are ALARA. (10 CFR Part 20). This LTR applies to building structures that remain in place after decommissioning and does not apply to releases of equipment from the facility before license termination. If licensees elect to dismantle building structures and dispose of the associated materials off site (in accordance with applicable regulatory requirements), rather than leave the building structures in place (for unrestricted use), the LTR does not apply to the associated materials moved off site prior to license termination (NRC 2006b). NRC ensures compliance through an ongoing inspection program that remains in place during decommissioning until the NRC license is terminated. Inspections cover Radiation Protection, Emergency Planning, Security, Engineering, and Operations all areas included in the licensed area, and decommissioning activities. The results of NRC inspections and any associated findings will be published in inspection reports that are publicly available (SCE 2016d).

The NRC (2014) reviewed and analyzed potential environmental impacts of stored SNF in the *Generic Environmental Impact Statement for Continued Storage of Spent Nuclear Fuel* (GEIS), published in September 2014 (NUREG-2157). The NUREG-2157 generically (i.e., it is not site-specific) evaluates potential environmental impacts and cumulative impacts to a broad range of resources, determines environmental impacts of continued storage, and addresses the environmental impacts of continued storage for use in future NRC environmental reviews. ("Environmental impacts of continued storage" means impacts resulting from storage of SNF at "at-reactor" and "away-from-reactor" sites after a reactor's licensed life for operation and until licensing of a permanent repository.)

The Proposed Project's established programs, processes, and procedures are devised in compliance with NRC requirements and are designed to lower the probability that exposure to radioactive materials would occur. Nonetheless, since the CSLC believes there is an inherent risk of radiological exposure at any facility where hazardous radiological materials are present that can never be fully eliminated, impacts associated with potential radiological release are identified in this EIR as significant and unavoidable.

As stated in the Site Characterization Report (AREVA 2015a), SONGS Decommissioning Plan activities would remove residual licensed radioactive material and hazardous

substances to cleanup levels that would allow the site, with concurrence from the NRC, to be released for unrestricted use, and the ~~o~~Onshore ~~s~~Site to be returned to the U.S. Department of Navy (DoN). The Participants would then prepare and submit to the NRC a License Termination Plan based on NRC-approved clean-up criteria that establish the guidelines for the Final Status Survey and ultimate termination of the SONGS Unit 2 and Unit 3 NRC licenses. Proposed activities related to the disposition of the SONGS Units 2 and 3 offshore intake and discharge conduits and other structures on lands within the CSLC Lease Facilities would be covered under a new lease.

4.1.1 Environmental Setting

This environmental setting focuses on hazards related to radiological and hazardous materials associated with the Proposed Project, including onshore D&D and offshore ~~conduit disposition~~ CSLC Lease Offshore Activities. Hazards associated with the storage of SONGS Units 1, 2, and 3 SNF in the NRC-licensed Independent Spent Fuel Storage Installation (Approved ISFSI) are part of the existing (baseline) condition at SONGS (see Section 1.5.1, *Baseline and Future Conditions*, in Section 1.0, *Introduction*). The Approved ISFSI would remain until the U.S. Department of Energy (DOE) takes possession of the SNF and transports the SNF offsite. Once the SNF is removed from the Approved ISFSI, the area would undergo further decommissioning to achieve final clean-up criteria established for the Approved ISFSI area. This EIR discloses, but does not analyze, Future Activities (estimated to begin in 2035), because the specific physical nature of activities to be conducted in the future are unknown at this time (see Section 1.5.2, *Uncertainty Regarding Future Decommissioning Plan Activities*).

For informational purposes, Appendix D1 of this EIR provides background information on management, storage, transportation, and disposal of SNF and HLW. Appendix D2 provides information from a Discharge Conduits Scoping Survey of onshore and offshore radiological conditions. Appendix D3 provides general background information on transportation of SNF, HLW, and radioactive materials, and the associated risks and industry experience. Appendix D4 provides background information on federal environmental review of the decommissioning of nuclear facilities, including the NRC (2014) GEIS. Appendices D1, D3, D4, and D5 are not directly related to analysis of the Proposed Project and are background papers provided to inform the public given the highly technical and high-profile nature of nuclear power plant decommissioning.

Results of an NRC inspection of SONGS Units 2 and 3 on September 12 to 15, 2016, are summarized below (NRC 2016a).

- **Decommissioning Performance**. The NRC determined that the licensee had completed Cold and Dark plant modifications in accordance with a Post-Shutdown Decommissioning Activities Report (PSDAR), provided as Appendix D6. The NRC inspected radiologically restricted areas and concluded that the licensee was maintaining the areas in accordance with radiation protection procedures and

regulatory requirements and had mitigating strategies for beyond design basis events.

- **Spent Fuel Pool Safety.** The NRC determined that the Units 2 and 3 spent fuel pools were being maintained pursuant to technical specifications and procedural requirements and that the licensee was safely storing spent fuel in wet storage.
- **Fire Protection.** NRC inspectors found that the licensee's fire protection program complies with regulatory and license requirements. The inspectors reviewed implementing procedures, equipment, staffing, training, and design control, conducted walk-downs of plant equipment, and observed control of combustible materials, housekeeping, and ignition sources.
- **Emergency Preparedness.** The NRC inspectors concluded the licensee appropriately implemented the 10 CFR Part 50.54(q)(3) requirements with respect to Permanently Defueled Emergency Plan/Action Levels and associated procedures, and that the licensee was implementing its Permanently Defueled Emergency Plan and maintaining the capability to respond to emergencies.

4.1.1.1 Onshore Radiological Conditions

Most onshore radiological decontamination would occur during Proposed Project activities. This would involve decontamination, dismantlement, and removal of certain above- and below-grade facilities, which would be transported to a permitted disposal facility (Table 2-1 lists activities proposed). Proposed Project work would occur in the following areas (see Figure 2-2): Auxiliary Building Area (ABA), East Road Area (ERA), Intake Structure Area (ISA), Make Up Demineralizer Area (MUDA), North Owner Controlled Area (NOCA), North Protected Area Yard (NPAY), South Protected Area Yard (SPAY), South Yard Facilities Area (SYFA), Turbine Building Area (TBA), Unit 2 Area (U2A), Unit 3 Area (U3A), North Industrial Area (NIA), and West Road Area (WRA).

Only limited ground-disturbing activities would occur in the Switchyard Area (SYA) and the, Approved ISFSI portion of the NIA, and an approximate 40-foot buffer zone around the ISFSI. A newly installed security fence around the Approved ISFSI delineates the boundaries of the Approved ISFSI area, excluding this area from Proposed Project activities. D&D activities would be concentrated in areas that were disturbed during SONGS operations; these areas are covered with asphalt, concrete, or gravel with minimal vegetation. Summary information regarding the recommended disposal methods, which are based on the levels of radiation found in the areas, is provided below in Table 4.1-2 (Appendix D2 contains the original 2015 Table D2-6. See *List of Survey Areas and Characterization Survey Conclusion* for additional information on levels of radiation within the Proposed Project area). Table 4.1-2 has been updated to reflect current SONGS area conditions.

4.1.1.2 Offshore Radiological Conditions

During reactor operations, water used for cooling was discharged into the ocean through three large conduits buried offshore. Because the Historical Site Assessment (HSA) and Site Characterization Report indicated that the conduits and adjacent seafloor areas have the potential for residual radioactive contamination (NRC 2000; AREVA 2015a, 2015b), SCE contracted with CB&I to perform a radiological scoping survey of the interiors of the SONGS Unit 2 and Unit 3 discharge conduit surfaces and offshore sediment adjacent to the discharge diffuser port locations, including the area where the Unit 2 and Unit 3 discharge conduits connect to the box culvert at the shoreward end of the conduits. (Minor cracking of the grout band seal developed at this "conduit displacement area" due to minor differential settling of the conduit; therefore, these areas were included by CB&I as sampling locations.)

Table 4.1-2. Radiological Characterization Survey Summary

Project Areas	Summary
South Yard Facility Area (SYFA)	The above grade paved area within the SYFA Open Paved Area (East) contains one localized contaminated area and other point-source contaminants. Following minimal remediation may qualify for low-cost disposal.
Make Up Deminer-alizer Area (MUDA)	May be suitable for low-cost disposal.
South Protected Area Yard (SPAY)	The surface of the concrete slab outside the Unit 3 equipment hatch contains low-level licensed radioactive contamination requiring remediation. Other SPAY surfaces do not contain licensed radioactive material contamination. May be suitable for low-cost disposal.
East Road Area (ERA)	The above grade paved area within the ERA Truck Bay/Fuel Handling Bay Paved Area contains very low activity levels of residual licensed radioactive contamination. May be suitable for low-cost disposal.
Unit 2 Area (U2A)	• ***Unit 2 Containment, Fuel Handling, & Penetration Buildings –*** will likely qualify for disposition as Class A low-level radioactive waste. • ***Unit 2 MSIV and Tendon Gallery Area & MSIV Open Area 30' –*** May be suitable for low-cost disposal. • ***Unit 2 Tank Enclosure Building –*** will likely qualify for disposition as Class A low-level radioactive waste. o Non-radiological tanks/associated components, and electrical tunnel components/structure may be suitable for low-cost disposal. o 1 square meter of contaminated area requiring remediation. May be suitable for low-cost disposal. • ***Unit 2 Safety Equipment Building*** o 8-foot elevation may be suitable for low-cost disposal. o Upper elevation components and structures including 30 feet and above may be suitable for low-cost disposal. o -15-foot elevation will likely qualify for disposition as Class A low-level radioactive waste.
Unit 3 Area (U3A)	• ***Unit 3 MSIV Open Area 30' –*** May be suitable for low-cost disposal.

Table 4.1-2. Radiological Characterization Survey Summary

Project Areas	Summary
	• ***Unit 3 Containment Building*** o Building radiological systems components except for the reactor vessel will likely qualify for disposition as Class A low-level radioactive waste. o All concrete structures in the containment building do not contain significant licensed radioactive material. Following minimal remediation may qualify for low-cost disposal. • ***Unit 3 Fuel Handling Building –*** will likely qualify for disposition as Class A low-level radioactive waste. o Concrete and steel structures and some of the components may be suitable for low-cost disposal. o Roof surface may be suitable for low-cost disposal. • ***Unit 3 Penetration Building –*** will likely qualify for disposition as Class A low-level radioactive waste. o After removal of the most significantly contaminated bare concrete beta wall and some floor scabbling, the concrete and steel structures are likely suitable for low-cost disposal options. o Plant continuous exhaust and containment exhaust ducts and valves may be suitable for low-cost disposal. • ***Unit 3 Tank Enclosure Building (TEB) –*** will likely qualify for disposition as Class A low-level radioactive waste. o Non-radiological tanks and components, and electrical tunnel components and structure may be suitable for low-cost disposal. o The lower elevations of the U3A AFW Tunnels has a 1 square meter contaminated area requiring remediation. • ***Unit 3 Safety Equipment Building*** o The 8-foot elevation may be suitable for low-cost disposal. o Upper elevation components and structures including 30 feet and above may be suitable for low-cost disposal. o The -15-foot elevation will likely qualify for disposition as Class A low-level radioactive waste. • ***Unit 3 MSIV and Tendon Gallery Area*** – may be suitable for low-cost disposal.
Auxiliary Building Area (ABA)	• ***ABA Radwaste Building –*** will likely qualify for disposition as Class A low-level radioactive waste. o The concrete and steel structures and some of the components may be suitable for low-cost disposal. o Control Element Drive Mechanism Control Room and related components may be suitable for low-cost disposal. • ***ABA Control Building –*** does not contain significant licensed radioactive material and requires only routine household cleaning techniques versus scabbling or wire brushing techniques. Following minimal remediation may qualify for low-cost disposal.
Turbine Building Area (TBA)	• ***Unit 2 & Unit 3 Sumps –*** do not contain significant licensed radioactive material. May qualify for low-cost disposal.

Table 4.1-2. Radiological Characterization Survey Summary

Project Areas	Summary
	• ***Unit 2 & Unit 3 Building Structures –*** do not contain significant licensed radioactive material. Following minimal remediation may qualify for low-cost disposal. • ***Unit 2 & Unit 3 - FFCPD Building –*** do not contain licensed radioactive material contamination. May be suitable for low-cost disposal.
North Industrial Area (NIA)	Does not contain significant licensed radioactive material. May qualify for low-cost disposal (with the exception of the Approved ISFSI)
Switchyard Area (SYA)	Does not contain licensed radioactive material in excess of 10 percent of NRC screening levels. Following minimal remediation may qualify for low-cost disposal.

The following areas also do not contain licensed radioactive material contamination and may be suitable for low-cost disposal.

- Intake Structure Area (ISA)
- West Road Area (WRA)
- North Protected Area Yard (NPAY)
- North Owner Controlled Area (NCOA)
- Storm/Yard Drain Network (SYDS)

Source: AREVA 2015a; SCE 2018e; SCE 2018f.

Sampling was performed in December 2016 (CB&I 2017; see report for sampling locations). The survey results (see Table 4.1-3) detected two plant-related radionuclides, Cs-137 and Co-60, inside the discharge conduits; Co-60 was also detected in three of 16 ocean bottom sediment samples collected near the discharge diffuser ports and conduit displacements. The amounts detected were below the NRC's regulatory thresholds. Additional information regarding the levels of radiation found in these areas can be found in Appendix D2, *Radiological Scoping and Characterization Data*.

Table 4.1-3. Results of 2016 Discharge Conduit Radiological Scoping Survey

Location/Sample Type[1]		# Samples	Nuclide	# Positive Results	Range (pCi/g)	Average (pCi/g)
Unit 2	Internal Scrapings	10	Co-60	4	0.061 – 0.79	0.067
	Internal Sediment	10	Co-60	10	0.16 – 2.2	0.97
			Cs-137	1	0.14	0.14
Unit 3	Internal Scrapings	10	Co-60	1	0.049	0.049
	Internal Sediment	10	Co-60	1	0.66	0.66
			Cs-137	2	0.11 – 0.12	0.12
Ocean Bottom Sediment (External) samples near Units 2 and 3		16	Co-60	3	0.059 – 0.092	0.072

Source: CB&I 2017.

Acronyms: Co = cobalt; Cs = cesium; pCi/g = picocuries per gram.

Notes: [1] Internal samples were collected in each Unit's conduit every 50 feet, starting 50 feet out from the stop gates located at the individual plant exits before each discharge conduit. External samples (12) were taken approximately 12 feet to the north and south of each sample location. Additional samples (4) were taken at conduit displacements near each unit.

4.1.1.3 Radiation Exposure

Occupational Exposure

Occupational doses are limited for an individual worker to a maximum of 5 rem Total Effective Dose Equivalent (TEDE) per year, with separate limits for dose to various tissues and organs (10 CFR Part 20). A rem is a unit of measure for larger doses of radiation.[25] TEDE represents the sum of the effective dose equivalent (for external exposures) and the committed effective dose equivalent (for internal exposures).

Public Exposure Limits

The NRC and U.S. Environmental Protection Agency (USEPA) have established three layers of radiation protection limits to protect the public against potential health risks from nuclear power plant spills or radioactive liquid leaks (Table 4.1-4). The NRC analysis concludes that doses to the public from abnormal tritium releases at nuclear power plants are well below the strictest protective limits and, therefore, do not pose a measurable risk to public health and safety (NRC 2016f).

Table 4.1-4. Radiation Protection Limits

Limit	Description
Layer 1 3 mrem per year (ALARA Objective) Appendix I to 10 CFR Part 50	Off-site radiation doses from gas and liquid releases. The "as low as reasonably achievable" (ALARA) annual off-site dose objective for liquid releases (e.g., diluted tritium) is 3 mrem (3 percent of the annual public radiation dose limit of 100 mrem) to the whole body and 10 mrem to any organ of someone living close to the plant boundary. This ALARA objective is a small fraction of the natural background radiation dose.
Layer 2 25 mrem per year standard 10 CFR Part 20.1301(e)	Dose limits for individual members of the public related to nuclear power operation. In addition to NRC limits on effluent releases, nuclear power plant releases to the environment must comply with USEPA standards in 40 CFR Part 190, "Environmental radiation protection standards for nuclear power operations." These standards limit the annual dose equivalent from normal operations of uranium fuel-cycle facilities (except mining, waste disposal operations, transportation, and reuse of recovered special nuclear and by-product materials). Radon and its decay products are excluded from these standards. These USEPA radiation dose limits are 25 mrem (whole body), 75 mrem (thyroid), and 25 mrem (any other organ of an individual member of the public). These standards apply to all nuclear power plants and facilities that mill and manufacture nuclear fuel. NRC's ALARA objectives are lower than the USEPA standards.
Layer 3 100 mrem per year limit	Dose limits for individual members of the public related to civilian facilities using radioactive material. This third and final layer limits radiation doses to 100 mrem per year for individual members of the public. This limit applies to every civilian facility that uses radioactive material. Compliance is demonstrated by measurement or calculation, to show that (1) the

[25] Regulatory limits and chronic doses are often given in units of rem or millirem (mrem [1 thousandth of a rem]) per year, which represents the total amount of radiation allowed (or received) over the entire year.

10 CFR Part 20.1301(a)(1)	highest dose to an individual member of the public from sources under the licensee's control does not exceed the limit or (2) the annual average concentrations of radioactive material released in gaseous and liquid effluents do not exceed levels specified in 10 CFR Part 20, Appendix B, Table 2, at the unrestricted area boundary. The dose from external sources in an unrestricted area should also not exceed 0.002 rem in any given hour or 0.05 rem in 1 year.

Acronyms: ALARA = as low as reasonably achievable; CFR = Code of Federal Regulations; mrem = millirem; NRC = U.S. Nuclear Regulatory Commission; USEPA = U.S. Environmental Protection Agency.

The NRC's "as low as is reasonably achievable" (ALARA) program, which requires the reduction of radiation exposure to ALARA, applies site-wide and includes both decommissioning and routine operational activities at the nuclear facilities (e.g., spent fuel pools and Approved ISFSI). Program elements include: job planning; dose controls and administrative limits; application of temporary shielding, if appropriate; pre-job briefings; dose estimates to identify priorities, establish goals, and monitor performance; and use of mockups and training for specific high-dose jobs. Work must be controlled to minimize occupational radiation exposure, and to prevent the uncontrolled spread of radioactive materials or release of radiation to areas where a member of the public could be affected. SCE has an established Radiation Work Permit (RWP) for this control. RWPs provide a mechanism for notification, planning, and approval of work involving radiation exposure or use of radioactive material during a specific time period. RWPs also identify the radiological conditions associated with the job and prescribe the limits, monitoring requirements, and protective measures applicable to the work in progress. The information on the RWP is made available to the worker for reference prior to the radiological work activity.

4.1.1.4 Radiological Studies

To determine onshore and offshore radiological conditions based on applicable License Termination Criteria (Derived Concentration Guideline Levels [DCGLs]), SCE prepared for NRC review an HSA, a Site Characterization Report, and other reports. The documents required by the NRC include those listed in Table 4.1-5. SCE is required to develop and submit a License Termination Plan to the NRC 2 years before conducting the SONGS Final Status Survey. The NRC will review the License Termination Plan, Final Status Survey Plan, and DCGLs developed for release of the SONGS site before Final Status Survey activities commence (NRC 2006a; AREVA 2015a).

NRC (2006b) indicates that restrictions or applicability of use and site-specific DCGLs might be developed for SONGS, for example:

- Building Surface Residual Radioactivity
    - The residual radioactivity on building surfaces (e.g., walls, floors, ceilings) should be surficial and non-volumetric (e.g., < 0.39 inch of penetration).

- Residual radioactivity on surfaces is mostly fixed (not loose), with the fraction of loose (removable) residual radioactivity no greater than 10 percent of the total surface activity. Note that for cases when the fraction of removable contamination is undetermined or higher than 0.1, licensees may assume for screening purposes that 100 percent of surface contamination is removable, and therefore the screening values should be decreased by a factor of 10 (see footnote a to Table H.1, NUREG-1757, Vol. 2).
- The screening criteria are not being applied to surfaces such as buried structures (e.g., drainage or sewer pipes) or equipment within the building without adequate justification; such structures, buried surfaces, and clearance of equipment should be treated on a case-by-case basis.

- Surface Soil Residual Radioactivity
  - The initial residual radioactivity (after decommissioning) is contained in the top layer of the surface soil (e.g., approximately 15 cm [5.9 inches]).
  - The unsaturated zone and the groundwater are initially free of residual radioactivity.

The vertical saturated hydraulic conductivity at the specific site is greater than the infiltration rate (e.g., there is no ponding or surface runoff).

Table 4.1-5. Documents Required by NRC for Hazardous Materials Analysis[1]

Historical Site Assessment (HSA) (AREVA 2015b)	The HSA includes a comprehensive investigation designed to collect, organize, and evaluate existing historical information relative to the SONGS site from start of operations through August 2014. The HSA identified potential, likely, or known sources of radioactive and non-radioactive contamination within buildings, on plant structures, and in the site's surface and subsurface environment, based on existing or derived information.
Site Characterization Report (AREVA 2015a)	The Site Characterization Report is a planning document required by the NRC to develop focused work plans to carry out additional investigation during decommissioning. Site characterization is a general term for activities performed to evaluate the location, type, and level of radioactive and other hazardous materials present. The characterization survey identified which portions of the site (e.g., soil, structures, and water) are potentially contaminated (non-radiological and radiological) and which have not been affected. In some cases, where no remediation is anticipated, results of the characterization survey indicated compliance with Derived Concentration Guideline Levels established by the regulatory agency. The NRC-required Site Characterization Report provided important information for the planning for D&D activities to determine the various SSC waste profiles and the appropriate levels to which such materials need to be removed. As decommissioning work progresses, additional in-process characterization is planned as some of the internal surfaces of SSCs are uncovered and become accessible for surveys. This in-process

Table 4.1-5. Documents Required by NRC for Hazardous Materials Analysis[1]

	characterization allows for the collection of adequate data for waste management, transportation, and building surface decontamination purposes and supports work planning.
Radiological Scoping Survey (CB&I 2017; see also Appendix D2)	In December 2016, CB&I (2017) conducted a radiological scoping survey of the interior of the SONGS Unit 2 and Unit 3 discharge conduit surfaces and offshore sediment adjacent to the discharge diffuser ports. The USEPA Method 901.1, Gamma Spectroscopy was performed on all samples specifically for Cs-134 and Cs-137, as well as for any additional radionuclides the analysis detected. Samples were analyzed by the National Environmental Lab Accreditation Program accredited TestAmerica Laboratories, Inc., St. Louis (analytical laboratory).
Annual Radioactive Effluent Release Report (ARERR) annual results	The SONGS ARERR includes the sampling and analysis of groundwater monitoring wells located at the SONGS site for all plant-related licensed radionuclides, including hard-to-detect radionuclides.
Radiological Environmental Monitoring Program (REMP) annual results	The SONGS REMP, which is part of the Annual Radiological Environmental Operating Report (AREOR), includes the sampling of environmental media and measuring radiation levels in the environment surrounding SONGS. Sampled media includes soil, shoreline sediment (beach sand), air (particulate & iodine), local crops, non-migratory marine species, kelp, drinking water, ocean water, and ocean bottom sediment.

Note: [1] The NRC has not summarized the status and acceptability of the documents noted above.

The Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)[26] suggests that if an HSA indicates an area is impacted, further investigation (site characterization) is needed and a radiological scoping survey may be performed to achieve the following objectives (NRC 2000):

- Perform a preliminary hazard assessment
- Support classification of all or part of the site as a Class 3 area (an impacted area that is not expected to contain any residual radioactivity or is expected to contain very low levels of residual radioactivity)

[26] The MARSSIM provides detailed guidance on how to demonstrate that a site is in compliance with a radiation dose- or risk-based regulation. MARSSIM focuses on the demonstration of compliance during the final status survey following scoping, characterization and any necessary remedial actions. MARSSIM, Revision 1 (August 2000), including the June 2001 updates, is available in print or electronic format at the following USEPA website: https://www.epa.gov/radiation/download-marssim-manual-and-resources. A supplement to the MARSSIM, also discussed in this EIR, is the Multi-Agency Radiation Survey and Assessment of Materials and Equipment Manual (MARSAME), which provides technical information on survey approaches to determine proper disposition of materials and equipment (see https://www.epa.gov/radiation/marsame-manual-and-resources). The difference between the manuals is:

- MARSSIM is for SITE surveys
- MARSAME is for Materials and Equipment (M&E) surveys.
- While MARSSIM is applicable to real property (buildings and land), MARSAME applies to non-real materials and equipment.

- Evaluate if the survey plan can be optimized for use in the characterization or Final Status Survey
- Provide input to the characterization survey design if necessary

To facilitate site characterization, SCE divided the 15 large areas of SONGS and buildings into MARSSIM survey areas to evaluate the residual level of radioactivity; the areas were further subdivided into appropriately sized survey units (AREVA 2015a). Further discussion and analysis of applied recommendations per the MARSSIM or MARSAME are provided in Appendix D2. Specifically, Appendix D2 lists the major project areas and components with respective conclusions as to contamination, and the plant systems and their respective components (the MARSAME classification is provided as well as an indicator on certain Class 2 and 3 systems that may be suitable for release).

The site characterization survey collected a large quantity of data regarding residual radioactive contamination; however, certain items and areas could not be sampled due to access limitations, which were noted in the report (AREVA 2015a). Additional sampling is anticipated as the decommissioning process continues, and structure surfaces or areas become available. The Decommissioning General Contractor (DGC) will use information in the Site Characterization Report to develop plans for decontamination, dismantlement, and disposal, and the costs associated therewith; to develop the SONGS License Termination Plan; and for input for the Final Status Survey design (AREVA 2015a).

In 2016, an offshore Radiological Scoping Survey (CB&I 2017) on the Units 2 and 3 discharge conduits was also completed to provide site-specific information and judgment measurements (also known as Biased Measurements), which are performed at locations selected using professional judgment based on unusual appearance, location relative to known contamination areas, high potential for residual radioactivity, and general supplemental information (NRC 2000). In addition to the Radiological Scoping Survey results (see Section 4.1.1.1, *Onshore Radiological Conditions*, above), the enclosures to SCE's application to the NRC for the partial site release for the Unit 1 offshore conduit indicated that it was impacted (i.e., contained residual radioactivity) and included calculations and radiological dose evaluations for nine plant related nuclides (SCE 2007). A radiological "dose" is the amount of radiation absorbed by an object or person. is The NRC (2009) review under 10 CFR Part 50.83 stated:

> *SCE conducted characterization surveys of the SONGS-1 components and CSLC lease area that are subject to the partial site release and identified low concentrations of radioactive cesium, cobalt, and sodium in the sediments surrounding the SONGS-1 CWS [Cooling Water System]. These concentrations result in a total calculated dose to the public of less than 1 millirem per year (mrem/yr), which is below the NRC unrestricted use release limit of 25 mrem/yr.*

SCE also monitors public exposure from the Approved ISFSI in its REMP. The 2017 REMP (SCE 2018f) concludes that:

> *The environmental monitoring data collected during 2017 supports a conclusion of no adverse effect on the population or the environment from SONGS. The radiation exposures to people living in the surrounding area from SONGS remains less than 2 mrem per year, which is a small fraction of the radiation exposures in the environment from the natural background from terrestrial and cosmic radiation.*

The closest publicly accessible locations to the Approved ISFSI are outside the plant's perimeter along the public access walkway, which is approximately 120 feet from the Approved ISFSI, and along the San Onofre Beach access road, which is approximately 1,000 feet away. Assuming a maximum occupancy of 300 hours per year, the dose to a member of the general public located along the San Onofre Beach access road is less than 1 mrem per year at this location (ENERCON 2014). With the ~~expanded~~ Approved ISFSI fully loaded with SNF, a statistically insignificant increase in public dose would occur at the public walkway location, but would still remain <1 mrem per year at the location, well under the NRC's public dose limit of 25 mrem per year (for the whole body) of direct radiation from Approved ISFSI operations (10 CFR 72.104) (SCE-AM 2018f).

Units 2 and 3 disposition activities are scheduled to occur in the mid- to latter-part of the Proposed Project, when radionuclide levels would be further reduced to a fraction of the NRC Screening Levels due to their half-life (see Table D2-3 in Appendix D2). Public exposure would be correspondingly significantly less than the public exposure limits, pursuant to 10 CFR Part 20. Appendix D2 shows the multiple measurement and sample types performed or conducted for radiological characterization of the SONGS site and installed features (SCE 2016b; AREVA 2015a).

Before performing a Final Status Survey, DCGLs must be acceptable to the NRC for each radionuclide of concern identified at the site. The site must also be divided into survey units according to floor or outdoor area sizes, as recommended by MARSSIM. Area classification considers both contamination levels relative to the DCGL and contamination distribution. Contamination may be uniformly distributed or present as small areas of elevated activity. Site-specific DCGL values for assessing licensed radioactive contamination in open land areas and on surfaces of structures remaining at the time of license termination were developed and documented in the Summary Report for the SONGS DCGL Development Project March 2015 (BHI Energy Power Services 2015). Since site characterization work started prior to these values being developed, NRC Screening values from NUREG-1757 were applied to evaluate residual radioactive

contamination for SSCs and environs expected to be present on the SONGS site at the time of license termination. (AREVA 2015a).[27]

4.1.1.5 Groundwater Protection

In August ~~2016~~2006, low levels of tritium and Cs-137 were encountered in groundwater during the SONGS Unit 1 containment lower sphere dismantlement. An investigation to characterize these low tritium concentrations and to identify the potential source determined that the low concentrations were present in the shallow groundwater situated generally between the former Unit 1 containment and Fuel Handling Building (FHB) and extended towards the seawall. Dewatering wells were installed to facilitate access to the containment sphere foundation and other subsurface foundations. These dewatering wells showed no Cs-137, and levels of tritium were well below all regulatory limits (AREVA 2015a). Although these samples indicated the presence of tritium, the sample results were at concentrations below the USEPA drinking water limit of 20,000 picocuries per liter (pCi/L). An extraction plan was implemented to initiate hydraulic containment of the tritium and to facilitate monitoring and documentation of any changes in tritium concentration. From January 1, 2015, to April 28, 2015, shallow groundwater beneath the former Unit 1 area was extracted. The resultant water was managed and discharged through an Offsite Dose Calculation Manual (ODCM)-credited release point. Groundwater extraction has ceased, with no indications to date of a tritium rebound (SCE 2016e). Activity results have been noted in the Annual Radioactive Effluent Release Reports throughout the years. For the sampling conducted in 2017, tritium concentrations are below the LLD values stated in the REMP.

Reviews of SONGS-area hydrogeologic characteristics by a geotechnical consultant to the City of San Clemente and by SCE geologists concluded that any inadvertent contamination of ground water beneath SONGS would not affect upgradient sources of drinking water (SCE 2016a – DR# 1-105A). Groundwater beneath SONGS is not a source or drinking water and so is not regulated by the Offsite Dose Calculation Manual (ODCM), which is a supporting document of the Radiological Effluent Technical Specifications (NUREG 0472, SCE 2016a); however, SCE monitors the groundwater in accordance with the ODCM. The *a priori* LLD values for water samples were reviewed from the 2015 and 2017 ARRER document (see Table 4.1-6). Uranium from natural origins – based on the relative ratios of uranium (U)-234, U-235, and U-238 compared to the ratios that would

[27] I&E Circular 81-07 states "Contamination monitoring using portable survey instruments or laboratory measurements should be performed with instrumentation and techniques (survey scanning speed, counting times, background radiation levels) necessary to detect 5,000 dpm/100 cm^2 total and 1,000 dpm/100 cm^2 removable beta/gamma contamination. Instruments should be calibrated with radiation sources having consistent energy spectrum and instrument response with the radionuclides being measured. If alpha contamination is suspected appropriate surveys or laboratory measurements capable of detecting 100 dpm/100 cm^2 fixed and 20 dpm/100 cm^2 removable alpha activity should be performed." (NRC 1981.)

be expected from 3.5 percent enriched uranium – were reported in the groundwater.[28] All positive results (results greater than the LLD) for beta and alpha radioactivity[29] were reported to be of natural origin and not from plant operation, or from external sources (e.g., Fukushima, nuclear weapons testing, medical uses of radionuclides). Transuranics analyses were performed when Gross Alpha was above 15 pCi/L (SCE 2016e).

Table 4.1-6. Lower Limit of Detection (LLD) for Water Samples

Analyte	LLD (picocuries per liter)
H-3	3000
Gross Beta	4
Gross Alpha	3
Gross Gamma (Cs-137)	18
Nickel-63 (Ni-63)	50
Iron-55 (Fe-55)	200
Strontium-89/90 (Sr-89/Sr-90)	2
Transuranics	1

Source: SCE 2016e; SCE 2018e; SCE 2018f.
Note: Radionuclides and LLDs for samples collected during characterization also included Fe-59 – 30 pCi/L, Co-60 – 15 pCi/L, and Cs-134 -15 pCi/L.

A Groundwater Protection Program (as discussed in Section 2.2.3.6, *Spill Prevention and Response and Groundwater Protection*) was initiated at SONGS in accordance with the federal "Industry Groundwater Protection Initiative, Final Guidance Document" (Nuclear Energy Institute [NEI] 2007) and is ongoing. A site hydrology study was completed as part of this initiative and was updated in 2012. Monitoring wells were installed around the plant to monitor for radionuclides. Acceptable levels of contaminants, as defined by the program, have been observed throughout the sampling implemented as part of this initiative, and described in the annual ARERR reports prepared by SCE. Appropriate program elements are to be maintained during decommissioning (ENERCON 2014). Licensees that have implemented a groundwater monitoring program consistent with the NEI Groundwater Protection Initiative are considered by the NRC to have an adequate program for the purposes of the Decommissioning Planning Rule (NRC 2014).

The 2017 ARERR (SCE 2018e) indicates that low, but detectable, concentrations of tritium have been identified in the shallow ground water area formerly occupied by Unit 1 that is currently identified as the NIA. However, as with previous year's samples, the 2017 results are well below all regulatory limits.

4.1.1.6 Waste Management

Per the PSDAR (see Appendix D6), SCE would develop plans to package and dispose of contaminated SSCs, contaminated soil, resins, water, and other plant process liquids

[28] ANL 2007 provides the natural ratios of U-234, U-235, and U-238 expected in the environment.
[29] EPA Method 900.0 (a standard industry screening technique for monitoring potential drinking water supplies for alpha and beta particle activities) was used to determine gross alpha/gross beta content.

(see Section 2.2.3.7, *Waste Characterization and Management*). A waste management plan is to be developed consistent with regulatory requirements for each waste type. The waste management plan would discuss available methods and strategies to process, package, and transport radioactive waste in conjunction with the available disposal facility and associated waste acceptance criteria (see Section 2.3.8, *Decommissioning Waste Volumes and Disposal Sites*, for information on waste disposal sites).

Any mixed wastes (hazardous and radioactive) generated during decommissioning would be managed in accordance with applicable federal and state regulations. As technology, resources, and processes become available, they would be evaluated to render the mixed waste non-hazardous. Mixed wastes from SONGS would be transported by licensed transporters and shipped to authorized and licensed facilities (SCE 2014a). Of note at the state level, Executive Order No. D-62-02 issued by Governor Davis in 2002 (California Office of Governor 2002) applies to the Proposed Project as it:

- Directed the nine California Regional Water Quality Control Boards (RWQCBs) to impose a moratorium on the disposal of decommissioned materials into Class III and unclassified waste management units until the California Department of Health Services completed an assessment of the public health and environmental safety risks associated with the disposal of decommissioned materials and until its regulations setting dose standards for decommissioning take effect
- Required the moratorium be implemented via cleanup and abatement orders issued by each RWQCB, which the San Diego RWQCB issued on October 11, 2002, with the release of Cleanup and Abatement Order No. R9-2002-330, *Moratorium on Disposal of Low-Level Radioactive Wastes* (RWQCB 2002)[30]

Radioactive Waste Treatment Processes (Gaseous and Liquid)

SCE intends for the radioactive waste treatment processes to continue to operate during decommissioning for as long as needed. As part of the Approved ISFSI element of the SONGS Decommissioning Plan, Units 2 and 3 would continue to have gaseous and liquid effluents from maintaining spent fuel pool operations until SNF is transferred to dry storage and the wet storage systems are decommissioned. Units 2 and 3 have liquid, gaseous, and solid waste processing systems that were designed to collect and process radioactive waste so that both on-site and off-site exposures are kept within the dose design objectives of 10 CFR Part 50, Appendix I, and within the limits as defined in 10 CFR Parts 20 and 100. Each of the radioactive waste treatment processes is discussed in detail in the SONGS Environmental Impact Evaluation (EIE) (ENERCON 2014).

[30] Order No. R9-2002-330 defines Class III wastes as “disposal sites designed to accept municipal wastes” and unclassified waste management units as “disposal sites that receive inert waste” (RWQCB 2002; https://www.waterboards.ca.gov/rwqcb9/water_issues/programs/land_discharge/docs/2002_0322wastemoratorium.pdf).

Release of Potentially Contaminated Liquids

The site historically used ocean water for condenser cooling and service water cooling functions. The operational demand for cooling and makeup water has been significantly reduced to ~~34,000~~approximately 17,000 gallons per minute (about 2 percent of full operational requirements) since Units 2 and 3 permanently ceased operation. ~~Service water cooling demands are primarily for spent fuel pool cooling. During the decommissioning period, SONGS plans to continue to reduce cooling water demands with the intent to eliminate such demands on the Pacific Ocean as soon as possible (SCE 2014a).~~

Discharge of liquids occurs via the Unit 2 or Unit 3 outfalls. As specified in the ODCM, liquids that may have been exposed to radionuclides would not be released from Units 2 and 3, either as a batch release or as continuous releases, until after sampling is performed for each release point and samples are analyzed per the ODCM. Once the appropriate levels are established for the in-line radiation monitoring instrument, the planned discharge is conducted, and the wastewater is released through the circulating water system to the Pacific Ocean (ENERCON 2014; SCE 2016e). ~~SCE (2014) is evaluating options to substantially reduce or eliminate routine liquid effluents using self-contained clean-up systems for ongoing systems and activities.~~

The Coolant Radwaste System and the Coolant and Boric Acid Recycle System have been removed from service. The Miscellaneous Liquid Waste System (MLWS) has been partially removed from service. A portion of the MLWS remains in service to store accumulated liquid radwaste. A new liquid radwaste processing system composed of filters, demineralizer vessels and pumps has been installed to process liquid waste before discharge at concentrations below regulatory limits, in compliance with the Offsite Dose Calculation Manual or ODCM, and consistent with the federal As Low As Reasonably Achievable (ALARA) principles. Batch processing includes recirculation within a tank and sampling and analysis of the water are performed to ensure that releases are below regulatory limits. All liquid releases are monitored as they are discharged, and the radiation monitors have both alarm and termination capability (SCE 2018l).

Radioactive Waste Gases

The gaseous waste management systems collect and process the radioactive noble gases, airborne halogens, and particulates to reduce the anticipated annual releases and personnel exposure in restricted and unrestricted areas to ALARA levels. Radioactive waste gases are collected and processed through the following systems, which would be decommissioned and eliminated when they are no longer needed (ENERCON 2014):

- ~~High-activity reactor coolant gaseous radwaste system~~
- Low-activity vent gas collection system
- ~~Main condenser ejector/evacuation system~~

- ~~Turbine gland seal system~~
- Building ventilation systems
- South Yard Facility Area – radiological work area and decontamination unit/shop

The Reactor Coolant Gaseous Radwaste System, the Main Condenser Evacuation System, and the Turbine Gland Seal System were removed from service as part of Cold & Dark activities (SCE 2018l). The quantities of gaseous effluents released from the site are limited as defined in the ODCM. The controls are specified for dose rate, dose due to noble gases, and dose due to radioiodine and radionuclides in particulate form. The gaseous radwaste system is used to reduce radioactive materials in gaseous effluents before discharge to meet the dose design objectives in 10 CFR Part 50, Appendix I. ODCM limits are designed to provide reasonable assurance that radioactive material discharged in gaseous effluents would not result in the exposure of a member of the public in an unrestricted area in excess of the limits specified in 10 CFR Part 20, Appendix B (ENERCON 2014). Points of ODCM-credited radioactive airborne releases are (ENERCON 2014):

- Containment purge vent stack—unit specific (Unit 2 and 3)
- Continuous exhaust plant vent stacks to handle effluents from fume hoods, waste gas discharge and vent headers (from waste gas decay tanks), laboratories, fuel handling, radioactive waste area, and safety equipment and penetration buildings
- ~~Main condenser ejector/evacuation system exhaust—unit specific (Units 2 and 3)~~
- ~~SYFA radiological work area and decontamination shop~~

Non-Radiological Hazardous Materials

SONGS is a large industrial facility that stores and uses many hazardous non-radiological materials for operation and maintenance. Hazardous chemicals include solvents, paints, cleaners, sealers, acids, hydraulic and motor oil, and diesel fuel. Many hazardous gases including argon, helium, butane, propane, freon, hydrogen/helium mix, nitrogen, methane, and oxygen are also stored on site. Large quantities (77,218 gallons) of mineral oil is contained in electrical equipment (SCE 2016b). Structures (building materials) are known to contain asbestos and lead-based paint (AREVA 2015b). Use of the hazardous chemicals creates waste characterized as Resource Conservation and Recovery Act (RCRA) waste and non-RCRA waste. Mixed waste (or combined waste) is hazardous waste that may also contain low-level radiological waste. Non-RCRA waste such as acidic debris, caustic debris, aerosol cans, paint, used oil and oil filters, batteries, waste grease/mixed sealant, and oily rags are stored on site for 90 days prior to disposal. Non-RCRA waste is exempt from the existing SONGS Hazardous Waste Storage Permit (California Environmental Protection Agency [CalEPA] – Department of Toxic Substances Control [DTSC] 2016). The RCRA mixed waste is stored on site no more than 1 year and is managed under the SONGS Hazardous Waste Facility Permit valid until May 2026

(CalEPA-DTSC 2016). The SONGS facility is classified as a large-quantity generator of hazardous waste and is included on the Hazardous Waste and Substances Sites (Cortese) list. However, although the site is a hazardous waste generator, it is not listed on the Cortese list for any of the reasons identified in Government Code Section 65962.5. There are currently no corrective action/cleanup activities being conducted by DTSC or the Regional Water Quality Control Board at SONGS (DTSC 2016).

Since June 2013, SONGS transitioned from operating status to shutdown status. During shutdown, many hazardous materials were removed from the operational areas of the facility. A site characterization study was completed in 2015 that included sampling for non-radiological hazardous contaminants on surface and near-surface soils, limited subsurface soil sampling, pavements and concrete, and surface wipe samples from structures (AREVA 2015a). Non-radiological hazardous materials or constituents of concern (COCs) included lead and polychlorinated biphenyls (PCBs) in paint, asbestos containing materials (ACM), naturally occurring asbestos (NOA) in concrete, lubricating and hydraulic oil (TPH), diesel fuel and gasoline (TPH), volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) found in solvents and cleaners, and heavy metals (Title 22 metals). Subsurface sampling and testing of soil was limited due to constraints related to safety issues (underground utilities) identified prior to the field sampling activities, which resulted in data gaps that would require investigation in the future when access and safety issues have been resolved.

Fifteen survey areas were identified in the HSA (AREVA 2015b) and characterized by inspection, sampling and field testing, and laboratory testing in the Site Characterization Report (AREVA 2015a). Results for each survey area are summarized in Table 4.1-7.

SONGS is a manned facility that is routinely inspected. SCE standard orders, plans, and operating instructions provide for quick response and cleanup of spills and procedures for the storage, handling, and disposal of hazardous waste. Examples include:

- Standard orders for routine inspections and hazardous waste handling, storage, and disposal (Standard Orders SO123-hk-1, SO123-IX-2.201, SO123-IX-2.206)
- Spill Prevention, Control, and Countermeasures Plan (SPCC) (SO123-XV-16)
- Spill Contingency Plan (SO123-XV-17.3)
- Containment of Oil, Hazardous Material, and Radioactive Spills (operating instructions) (SO23-4-6)

Non-radiological hazardous materials are not known to occur (no sampling or testing has been completed) within the beach or marine environment or in structures such as the conduits, seawall, or riprap.

Table 4.1-7. Non-Radiological Hazardous Material[1] Characterization Results

Survey Area (alphabetical)	Results	Study Conclusions
Auxiliary Building Area (ABA)	• Asbestos: none detected • Lead: in paint at concentrations considered hazardous • COCs: no subsurface soil or concrete surfaces sampled or tested	• No detectable asbestos • Lead-based paint present • Future investigation of subsurface soil required
East Road Area (ERA)	• Asbestos: none detected • Lead: in paint at concentrations considered hazardous • COCs: no subsurface soil or concrete surfaces sampled or tested	• No detectable asbestos • Future investigation of subsurface soil required
Intake Structure Area (ISA)	• Asbestos: none detected • Lead: in paint at concentrations considered hazardous • COCs: Title 22 metals and TPH detected in low concentrations in soils	• No detectable asbestos • Lead-based paint present • Soils contain low concentration of TPH and Title 22 Metals can be handled as non-hazardous waste • Future investigation of subsurface soil required
Make Up Demineralizer Area (MUDA)	• Asbestos: non-friable asbestos in detected in vinyl floor tile mastic; 5% Chrysotile detected • Lead: in paint at concentrations considered hazardous • COCs including Title 22 metals, TPH, PAHs, and SVOCs detected in low concentrations in soils; no COCs detected on concrete surface	• Lead-based paint and asbestos contained in building materials • Shallow soils (less than 5 feet) contain low concentration of TPH and Title 22 Metals can be handled as non-hazardous waste • Future investigation of subsurface soil required
North Industrial Area (NIA)	• Asbestos: none detected • Lead: in paint at concentrations considered hazardous • COCs: Title 22 metals, TPH, VOCs, and SVOCs detected in groundwater; not sampled or tested in subsurface soil or concrete surfaces	• No detectable asbestos • Lead-based paint present • Shallow groundwater (8 to 17 feet below NIA ground level) contains COCs above regulatory levels • Future investigation of subsurface soil required
North Owner Controlled Area (NOCA)	• Asbestos: detected in vinyl floor tile and mastic, and drywall joint compound • Lead: in paint at concentrations considered hazardous • COCs: Title 22 metals, TPH, VOCs, and SVOCs detected in low concentrations in soils	• Asbestos and lead-based paint detected in building materials • Soils contain low concentration of TPH and Title 22 Metals can be handled as non-hazardous waste • Future investigation of subsurface soil required, including at former gasoline UST (Case Closed status), former dry-cleaning facility, hydraulic oil releases, former machine shop, and oil/water separator

Table 4.1-7. Non-Radiological Hazardous Material[1] Characterization Results

Survey Area (alphabetical)	Results	Study Conclusions
North Protected Area Yard (NPAY)	• Asbestos: detected in vinyl floor tile and mastic/adhesive and in black water proofing material on piping; suspected in gaskets and asphalt roofing • Lead: in paint at concentrations considered hazardous • COCs: Title 22 metals, PAH, and TPH in soils and Title 22 metals, VOCs, and PAHs in groundwater detected at low concentrations • PCBs in paint at concentrations considered hazardous	• Asbestos and lead-based paint detected in building materials • Additional sampling and testing of suspected asbestos required • Soils contain low concentration of TPH and Title 22 Metals can be handled as non-hazardous waste • Low TPH in groundwater at diesel UST site requires further investigation prior to excavation and tank removal • Future investigation of subsurface soil required
South Protected Area Yard (SPAY)	• Asbestos: none detected • Lead: in paint at concentrations considered hazardous • COCs including Title 22 metals, TPH, PAHs, and SVOCs in soils, and Title 22 metals, VOCs, and PAHs in groundwater detected at low concentrations	• No detectable asbestos • Lead-based paint present • Soil adjacent to Unit 3 diesel UST contain low concentration of TPH and Title 22 Metals can be handled as non-hazardous waste • Low COCs in groundwater are below regulatory limits • Low TPH in groundwater at diesel UST site requires investigation prior to excavation and tank removal • Future investigation of subsurface soil required
South Yard Facility Area (SYFA)	• Asbestos: none detected • Lead: in paint at concentrations considered hazardous • COCs including TPH and SVOCs detected at low concentrations in concrete surfaces; Title 22 metals, VOCs, and PAHs detected at very low concentrations in groundwater • Other: no NOA detected in concrete sample	• No detectable asbestos • Low concentration of TPH on concrete can be handled as non-hazardous waste • Future investigation of subsurface soil required • Low COCs in groundwater are below regulatory limits; groundwater is greater than 90 feet below ground surface
Storm and Yard Drain Systems (SYDS)	• Only radiological sampling/testing • COCs: no subsurface soil or concrete surfaces sampled or tested in storm drain system catch basins	• Inspection and future sampling of residual sediment (if present) required prior to decommissioning
Switchyard Area (SYA)	• Asbestos: none detected • Lead: in paint at concentrations considered hazardous • COCs: not detected in concrete cores; Title 22 metals, TPH, PAHs, SVOCs, chlorinated herbicides in	• No detectable asbestos • Lead-based paint may be present • Soils contain low concentration of TPH, PAH, and Title 22 Metals can be handled as non-hazardous waste

Table 4.1-7. Non-Radiological Hazardous Material[1] Characterization Results

Survey Area (alphabetical)	Results	Study Conclusions
	soils and Title 22 metals and TPH in sediments detected in low concentrations	
Turbine Building Area (TBA)	• Asbestos: detected in tank insulation material; 30% friable Chrysotile • Lead: in paint at concentrations considered hazardous • COCs: Title 22 metals, TPH, PAHs, and SVOCs in soils detected in low concentrations; also detected in concrete cores at low concentrations • Other: PCBs detected in paint and building material; no NOA detected in concrete core sample	• Asbestos and lead-based paint detected in building materials • PCBs detected in building material/paint • Low concentration of TPH on concrete can be handled as non-hazardous waste • Future arsenic testing of concrete containment pads required • Future investigation of subsurface soil required
Unit 2 Area (U2A)	• Asbestos: none detected • Lead: in paint at concentrations considered hazardous • COCs: no subsurface soil or concrete surfaces sampled or tested • Other: Title 22 metals, TPH, and PAHs detected in low concentrations in sediment in drain line; concrete core contains low concentrations of TPH; no NOA detected in concrete sample	• No detectable asbestos • Low concentration of TPH on concrete can be handled as non-hazardous waste • Sediment in storm drain line contains lead; should be evaluated prior to demolition • Future investigation of subsurface soil required
Unit 3 Area (U3A)	• Asbestos: none detected • Lead: in paint at concentrations considered hazardous • COCs: no subsurface soil or concrete surfaces sampled or tested • Other: concrete core contains low concentration of TPH; no NOA detected in concrete sample	• No detectable asbestos • Lead-based paint present • Low concentration of TPH on concrete can be handled as non-hazardous waste • Future investigation of subsurface soil required
West Road Area (WRA)	• Asbestos: none detected • Lead: in paint at concentrations considered hazardous • COCs: Title 22 metals and TPH detected in low concentrations in soils	• No detectable asbestos • Lead-based paint present • Soils contain low concentration of TPH and Title 22 Metals can be handled as non-hazardous waste • Future investigation of subsurface soil required

Source: AREVA 2015a.
Acronyms: COC=Non-radiological hazardous materials/constituents of concern; NIA=North Industrial Area; NOA=naturally occurring asbestos; PAHs=polycyclic aromatic hydrocarbons; SVOC=semivolatile organic compounds; TPH=lubricating and hydraulic oil/diesel fuel and gasoline; UST=underground storage tank.
Notes: [1] Non-radiological hazardous material.

4.1.1.7 Radiological Monitoring

Per the Applicant (SCE 2018m) there is a radiation monitoring system in place around the Approved ISFSI and at selected locations in the plant to monitor direct radiation during fuel transfer operations from the Unit 2 and Unit 3 Fuel Buildings to the Approved ISFSI. The system at the Approved ISFSI utilizes Mirion Perimeter Monitors. Because it was designed for temporary use, this system will likely be retired following the completion of fuel transfer operations. However, a similar system that is designed for longer-term use (i.e., in order to withstand environmental conditions) could be implemented to support Proposed Project activities. As presently configured, the system is only internally accessible by specifically trained and qualified SONGS staff who are responsible for monitoring and evaluating the data against expected values and SONGS administrative and regulatory limits to determine if levels represent a hazard to workers or to the public. Under the existing SONGS Emergency Plan, workers and agencies are promptly notified if established regulatory levels are exceeded. For example, if it was determined (based on radiation levels) there was damage to a canister confinement boundary, SCE would have 15 minutes to notify the following agencies electronically via email: California Office of Emergency Services 24/7 Staffed Warning Point, County of Orange 24/7 Staffed Warning Point, County of San Diego 24/7 Staffed Warning Point, and Camp Pendleton Emergency 911 Dispatch (SCE-HN 2018a). In addition, SCE is required to notify the four agencies above and the NRC by phone, within no more than 60 minutes (SCE-HN 2018a).

In theory, the system's readings for direct radiation could be made available for public review in real time; however, there are practical concerns related to disseminating this type of information to the public in real time. For example, raw mrem/hr data released in real time would be susceptible to public misinterpretation, especially if, for example, an unrelated condition develops that might influence the readings or data; a monitor might fail and/or record inaccurate data, or an unknown entity could somehow manipulate or "hack" the public reporting system. Given the sensitive nature of the data in question, any misunderstanding or misreading of that data could lead to public alarm not commensurate with the actual situation. Therefore, while real-time radiation monitoring is technically feasible, the Applicants believe an alternative to the reporting of mrem/hr information in real time would be to report the information directly to a state or local emergency management agency, which would be responsible for evaluating the data and determining how to disseminate the information to the public. (SCE 2018m)

The monitoring of physical parameters (e.g., air, water, and marine sediments) to determine whether contamination of the surrounding environment has occurred as a result of SONGS decommissioning activities is also currently conducted by the Applicant under the SONGS Radiological Environmental Monitoring Program (REMP). This internal monitoring alerts SCE anytime a discharge or release from the plant exceeds established regulatory limits. This allows SCE to immediately notify state and local agencies, which

would in turn alert the public. However, this type of monitoring only yields raw data, which does not reflect the actual impact to the environment. (SCE 2018m).

Prior to the construction of SONGS, environmental samples and measurements were collected and analyzed to establish baseline levels of radiation in various environmental components around Southern California. As part of the REMP, physical samples are collected in the field and sent to specialized experts to test the samples, record relevant data, compare it against the baseline control specimens, and assess any differences. Based on that analysis, reports are then prepared and submitted to the NRC on an annual basis. The data acquired from the analysis of new samples are compared to the preoperational data, and to control samples, to gauge if changes in any radiation levels can be attributed to SONGS or to other causes, such as variations in the natural environment or humanmade contributions other than SONGS. (SCE 2018m)

This process requires the use of highly sensitive equipment that can discriminate between isotopes on the physical samples taken in the field, and that assessment must take place in an isolated laboratory setting because even small environmental influences can inhibit accurate functionality of the equipment. In addition, stringent quality control and regulatory requirements require detailed scientific practices in order to ensure that SONGS has reliable data to evaluate whether NRC license requirements, including those set forth in the Offsite Dose Calculation Manual, are being met. As part of that process, analyses are often also validated by comparison against a parallel set of laboratory-based analyses and/or results compiled by independent environmental radiation assessments performed by the California Department of Public Health (CDPH). (SCE 2018m).

CDPH performs their independent assessment through the collection and analysis of air samples, and the placement and analysis of dosimeters. The CDPH Radiation Health Branch (RHB) conducts routine monitoring of radioactive materials in the environment, including media such as air, milk, food, and water. Air sampling occurs at 14 locations adjacent to SONGS (CDPH 2019). In addition to collecting independent air samples, CDPH-RHB participates in a sample splitting program with SONGS and also maintains a thermoluminescent dosimetry monitoring program in the environs of SONGS, with eight stations sampled quarterly at sites located from San Clemente to Oceanside. Per CDPH request, the results of CDPH dosimeters that are co-located with SONGS dosimeters are reported in the Annual Radiological Operating Report. SONGS also participates in onsite and offsite inspections by CDPH. In addition, the CDPH Environmental Management Branch coordinates the Nuclear Emergency Response Program and is responsible for preparing an emergency response plan and training program, and conducting training programs for local, state, and federal officials for implementation in the event of a nuclear power plant accident. (CDPH 2017; CDPH 2018)

The USEPA operates the nationwide RadNet Program, which (with its predecessors) has been collecting environmental radiation data for more than 50 years. The Radnet Program

provides background radiation levels and has been used to detect and assess the consequences of radiological contamination since the days of atmospheric testing in the U.S. and internationally, and more recently Chernobyl, Fukushima, and other radiological accidents. RadNet has more than 130 radiation air monitors in 50 states, including five in Southern California; San Diego is the closest to SONGS. RadNet runs continuously (24 hours a day, 7 days a week) collecting measurements of gamma radiation. The program also collects and analyzes samples of air, precipitation, and drinking water nationwide to monitor radiation in the environment. Over time, RadNet sample testing and monitoring results show the fluctuations in normal background levels of environmental radiation and can also detect higher than normal radiation levels during a radiological incident. The Radnet Air Sampling program also collects air filter samples at the monitoring sites and sends them for detailed analysis at USEPA's National Analytical Radiation Environmental Laboratory. These analyses can detect trace amounts of radioactive material and isotopes that the air monitors cannot detect in real-time (USEPA 2018c).

4.1.2 Regulatory Setting

The primary federal and state laws, regulations, and policies that pertain to the Proposed Project are summarized in Appendix A (see also Section 1.2.1, *Legal and Governmental Authority: Federal* and Table 4.1-1 for a summary of federal responsibilities over nuclear power plants).

The NRC has complete oversight and compliance authority over the decommissioning of U.S. nuclear power plants, which includes on-going inspection and monitoring of all liquid and airborne radiological releases at SONGS and review of decommissioning plans (see Section 1.2.1.2, *U.S. Nuclear Regulatory Commission*). This exclusive jurisdiction over the radiological aspects of decommissioning preempts states and state agencies, including CSLC, from imposing any regulatory requirements related to radiation hazards or nuclear safety (see Section 1.2.1.3, *Federal Preemption*). Table 4.1-1, presented earlier in this section, details NRC's authority. Because the Proposed Project's onshore activities are under federal jurisdiction and are located on federal land, these activities are likely to occur, in accordance with the NRC operating license for Units 2 and 3, whether or not CSLC approves the lease associated with the Proposed Project.

Nonetheless, the California Environmental Quality Act (CEQA) requires the CSLC to consider "the whole of [the] action" in reviewing the Proposed Project, including those aspects of the project that are legally beyond its jurisdiction (i.e., regulation of radiological aspects of decommissioning) or geographically outside of its jurisdiction (i.e., activities performed onshore, outside of CSLC ownership). In an effort to meet CEQA legal requirements and objectives of meaningful public disclosure and informed decision making, this EIR analyzes all potential impacts of the Proposed Project—both those over which CSLC has the ability to impose mitigation and also those it does not.

Because SONGS is located on federal land on Marine Corps Base Camp Pendleton (MCBCP) and CSLC land offshore, local policies and ordinances do not generally apply to the hazardous and radiological material issues associated with the Proposed Project. An exception is the County of San Diego, Department of Environmental Health, Hazardous Materials Division (HMD), which is the Certified Unified Program Agency (CUPA) for San Diego County. The CUPA protects human health and the environment by ensuring that hazardous materials, hazardous waste, medical waste, and underground storage tanks are properly managed and has the authority to check storage areas for hazardous chemicals, including hazardous wastes. Facilities regulated by the HMD include those that handle or store hazardous materials, are part of the California Accidental Release Prevention Program, generate or treat hazardous wastes, or own or operate underground storage tanks. In its public scoping comments, the County requested that (see Appendix C, *Index to Public Scoping Comments*):

- SONGS environmental personnel, security personnel, and major contractor personnel changes be reported to HMD as soon as possible through the California Environmental Reporting System (CERS) including updated facility site map, hazardous materials and hazardous waste inventory information to ensure the most current information is available to first responders
- HMD be notified if access to the property changes and updated contacts be provided to the County of San Diego Hazardous Incident Response Team (HIRT)
- Arrangements for emergency services from local authorities should occur on a routine basis and the Applicant should arrange for HIRT walkthrough of storage areas and confirmation of notification procedures in the event of a release

The DTSC also has limited jurisdiction on the SONGS site, and issued a Hazardous Waste Facility Permit to SCE on May 23, 2016. According to this permit, D&D activities would result in the generation of hazardous waste, some of which would be contaminated with radionuclides. This waste is referred to as Mixed Waste or Combined Waste. DTSC regulates the hazardous component of Mixed Waste and Combined Waste. The radioactive component is regulated by the NRC (CalEPA and DTSC 2016).

4.1.3 Significance Criteria

4.1.3.1 Radiological Materials

The significance criteria used to evaluate the Project impacts to hazardous radiological materials or risk of upset impact are based on Appendix G of the State CEQA Guidelines. According to Appendix G of the State CEQA Guidelines, a significant impact would occur if the Project would:

- Create a substantial hazard to site decommissioning workers, the public, or the environment through decommissioning and disposal of radioactive materials

- Result in a design basis accident (DBAs) or severe (beyond design basis) accident occurs during decommissioning activities
- Increase the probability or volume of liquid spills containing radioactive material into the environment
- Increase radioactive airborne release points above those already listed as ODCM credited
- Increase residual radioactivity concentrations in ground, soil, or groundwater through dust control measures or through intentional dilution (mixing) of radioactive material with slightly contaminated or clean material
- Result in inadequate existing and proposed emergency response capabilities to effectively mitigate spills, fires, and other accident conditions involving radioactive material during decommissioning, such that there is a substantial impact on safety of the public and site workers
- Expose the low-level tritium plume identified in the Unit 1 area or identify other radioactive plumes on-site during decommissioning
- Be inconsistent with regulations applicable to radiological materials

4.1.3.2 Hazardous Materials

A hazardous materials or risk of upset impact is considered significant if any of the following apply:

- The Project creates a substantial hazard to the public or the environment through decommissioning and disposal of hazardous materials;
- There is a potential for fire, explosion, releases of flammable/toxic materials or oil, or other accidents resulting from decommissioning activities that could cause injury or death to members of the public;
- Decommissioning would increase the probability or volume of oil spills into the environment, and existing or proposed emergency response capabilities are not adequate to effectively mitigate Project spills and other accidents;
- The Project is located on a site included on a list of hazardous materials sites compiled pursuant to Government Code section 65962.5, and decommissioning activities would create a significant hazard to the public or the environment; or
- Project operations are not consistent with applicable regulations. Conformance with regulations does not necessarily mean no significant impacts exist.

4.1.4 Environmental Impact Analysis and Mitigation

The SONGS site includes numerous systems, structures and facilities that contain radiological materials (e.g., the spent fuel pools and Approved ISFSI) or have known or

potential contamination caused by releases of non-radiological or radioactive hazardous materials during the operation of the reactors and their support facilities. The natural environment at the site (including soil and groundwater) has also been impacted by the release of non-radiological and radiological hazardous materials during past operations.

Table 4.1-10 at the end of Section 4.1 summarizes the Proposed Project's potential impacts related to radiological and non-radiological hazardous materials and any measures recommended by the CSLC to reduce the level of significance.

Section 2.3, *Proposed Project Activities*, describes the variety of techniques and methods that SCE will use to decontaminate and decommission the site and facilities. The proposed methods are industry-standard techniques that have been employed on other similar D&D projects. The NRC analyzed these methods to identify the most effective available options, and to assess the potential for radiological exposure to workers, the public, or the environment.

4.1.4.1 Applicable Plans and Programs

SCE's operating license requires it to implement detailed plans and procedures to ensure that radiological releases are minimized or avoided, and to avoid accidents or minimize their impact. In September 2014, the Participants submitted to NRC a PSDAR (see Appendix D6) that included the plans and schedule to decommission SONGS Units 2 and 3 and the remaining activities to complete decommissioning of Unit 1 (retired in 1992) (SCE 2014a). SCE intends to update the PSDAR as needed. The NRC will also require SCE to prepare a Radiation Protection Program, Emergency Preparedness & Response Plan, and Physical Security Plan.

In addition to the plans required by NRC, the Applicant has proposed to prepare and implement several Project-specific plans to address hazardous waste such as a Waste Management Plan (Applicant-proposed measure [APM]-1), which addresses both radiological and non-radiological waste, a Hazardous Materials Business Plan (APM-2), a SPCC Plan (APM-13), and a Spill Contingency Plan (APM-14). See Table 2-3, Ongoing Plans, Programs, and Reports, for descriptions of these plans.

4.1.4.2 Radiological Hazards

This section analyzes potential impacts to the environment or the health and safety of workers and the public that could be caused by radioactive contaminated materials encountered during decommissioning. It assesses potential releases of radioactivity and radiological materials associated with decommissioning activities, as well as potential releases from accidents or upset conditions, including natural and manmade events. In general, the potential impacts related to radiological hazards are greatest during the dismantlement of the ~~o~~Onshore ~~s~~Site components. At the end of the Proposed Project, essentially all radiological materials, except for the SNF stored in the Approved ISFSI,

would be removed from the site. As a result, the likelihood for exposures would be reduced to those activities related to the ongoing monitoring and maintenance of the Approved ISFSI ~~(Approved ISFSI)~~ and future transport of SNF offsite (see Section 4.1.6, *Future Activities*).

Per the Applicant, although radiological materials present an ongoing hazard throughout decommissioning, there are well-established methods and techniques to limit exposures and mitigate the hazard. The long-term impact of the Proposed Project (after all D&D activities are completed) would be substantial and beneficial, and the site would be restored to a condition that permits unrestricted use.

The NRC uses terms from National Environmental Policy Act documents, such as those for license renewal or new reactors, to define the standard of significance for assessing environmental issues, as shown in Table 4.1-8, below.

Table 4.1-8. Federal Standards of Significance

SMALL	Environmental effects are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource.
MODERATE	Environmental effects are sufficient to alter noticeably, but not to destabilize, important attributes of the resource.
LARGE	Environmental effects are clearly noticeable and are sufficient to destabilize important attributes of the resource.

Source: NRC 2014

The *SONGS Units 2 and 3 Environmental Impact Evaluation* (ENERCON 2014), prepared for SCE, assessed potential impacts from SONGS Decommissioning Plan activities for each environmental issue using evaluations in the NRC (2002) *Final Generic Environmental Impact Statement (GEIS) on Decommissioning of Nuclear Facilities Supplement* (NUREG-0586) as a guide. Like the NUREG-0586 evaluations, the analysis assumed that operational measures would be continued and would not need to rely on implementation of new measures unless specified. Environmental releases, waste volumes, and other environmental interfaces were estimated. These data were assessed against the potential for impact and the existing conditions at SONGS, and a NRC significance level of SMALL was determined (ENERCON 2014, see Table 4.1-8).

ENVIRONMENTAL IMPACT ANALYSIS

Impacts of the proposed Project and recommended MMs and Applicant-proposed measures (APMs) are examined in this section.

Impact HAZ-1: Release of Hazardous Radioactive Materials During Decommissioning and Disposal.

Although unlikely, the Proposed Project decommissioning activities could significantly increase worker risk above baseline operations and could create a significant hazard to the public; therefore, the impact remains potentially significant **(Significant and Unavoidable).**

Impact Discussion

Nearly all decommissioning activities have the potential for radiation exposures that could adversely affect the health of workers and the public (NRC 2002), including the D&D activities contemplated for the Proposed Project, even though nuclear power production at SONGS has ceased and nuclear fuel has been removed from the Units 2 and 3 reactor cores. Without implementation of measures to contain or manage airborne fugitive dust, contaminated soils, or liquid effluents, workers or the public could be exposed to radioactive materials during the excavation and disposal of radioactive contaminated materials or cleaning of radioactively contaminated surfaces.

Many of the Proposed Project activities, particularly those occurring onshore and those related to upland plant decommissioning and radiological decontamination, are beyond CSLC jurisdiction. This is because (1) CSLC's jurisdiction at SONGS is seaward of the ordinary high-water mark, (2) onshore activities at SONGS are located on land owned by the federal government (DoN), and (3) NRC has complete oversight and compliance authority over the decommissioning of U.S. nuclear power plants, including radiological aspects of decommissioning. CSLC's approvals related to the Proposed Project are therefore limited. Because the Proposed Project's onshore activities are located on federal land and are under federal jurisdiction, these activities are likely to occur whether or not CSLC approves the lease associated with the Proposed Project, per the NRC operating license for Units 2 and 3.

Airborne Fugitive Dust

As described in Section 2.3, *Proposed Project Activities*, most radiological decommissioning activities would occur during the Proposed Project, including the demolition and disposal of numerous above- and below-grade SSCs. These demolition activities could contribute to radiological impacts by contributing to offsite airborne releases (ENERCON 2014). Open air demolition of small and large structures is also a potential source of fugitive dust.

During decommissioning, releases to the air may occur as planned emissions from routine decommissioning operations or from accidents resulting from equipment failures or human error. Development of a program to limit or eliminate accidental releases requires an understanding of the types of radionuclides that may be released, the

characteristics of the releases, and the potential for exposure to a person who resides just beyond the site fence or population downwind of the site.

Currently, radioactive airborne releases are monitored at ODCM-credited release points, as described in Section 4.1.1.54, *Radiological Studies*. During decommissioning, airborne radiological releases would be monitored and would be required to be below the same radiological limits as if the plant was in operation (SCE 2016d). As demolition work progresses, the existing ODCM-credited points would be demolished, but the potential for fugitive dust release would continue to exist due to ongoing demolition activities, such as rubblization.[31] Local transport of radioactively contaminated SSCs could also generate local radioactive airborne sources.

As required by the NRC, SCE and the DGC would implement additional environmental monitoring, including deployment of semi-permanent or mobile air monitoring stations in downwind locations to provide early warning of any radioactive airborne materials escaping from work activities. This action is a standard industry practice. In addition, before performing large-scale structure demolition, SCE would prepare a demolition plan as described in Section 2.3.2.3, *General Approach to Structure Demolition*, for individual structures or groups of structures that specifies requirements or controls that must be in place before and during demolition. If the structure does not meet the open-air criteria, it would be contained inside a temporary enclosure, with ventilation and filtration to prevent the spread of contamination to uncontrolled areas. The open-air criteria are based on residual contamination levels on the surfaces of the structures or within SSCs and are intended to ensure radiological material is not released to uncontrolled areas or the environment. SSCs that do not meet the open-air criteria would either be protected to ensure large-scale demolition techniques do not pose hazards to personnel or the environment or would be carefully removed prior to commencing open-air structure demolition (SCE 2016d).

In accordance with San Diego Air Pollution Control District (SDAPCD) dust abatement requirements, SCE would implement standard dust control measures during decommissioning such as applying sufficient water or non-toxic soil stabilizers on all unpaved work areas, transport routes, parking areas, and staging areas to minimize fugitive dust generation (APM-4, ENERCON 2014). Water used for dust suppression would come from on-site hydrants or recycled water (rain and stormwater collected in on-site sumps) could be used for dust suppression (see Section 2.3.10, *Water Use and Power Supply*). In addition, SCE would isolate, contain, or cover contaminated demolition debris to control the spread of radioactive or other hazardous materials. Various industry standard control methods would be employed depending on the degree of contamination.

[31] **Rubblization** is a construction and engineering technique that involves saving time and transportation costs by reducing existing concrete into rubble at its current location rather than hauling it to another location. Rubblization has two primary applications: creating a base for new roadways and decommissioning nuclear power plants.

A typical approach is to separate the immediate work area from other areas and implement access control. This approach usually includes application of cover material or fixatives to lock down contamination once a SSC is removed from its installed location. Smaller pieces of concrete or tools would be placed in waste containers and then moved to truck(s) or rail car(s) for shipment (SCE 2016d). Based on the analyses described in the EIE (ENERCON 2014), which indicate that potential air quality impacts during decommissioning would be within the bounds of the generic impacts evaluated by NRC (2002) in the *Final GEIS on Decommissioning of Nuclear Facilities Supplement* (NUREG-0586), SCE has determined that radiological impacts associated with any fugitive dust or other airborne releases during decommissioning are expected to be well within NRC standards (ENERCON 2014) and comply with SDAPCD dust abatement requirements.

Contaminated Soils

The filling of voids within existing structures below grade may require 260,000 to 320,000 cubic yards of backfill material (see Section 2.3.9, *Import Volumes*). No material from contaminated structures (neither clean nor contaminated) would be permanently used as backfill. All backfill materials would come from offsite sources (SCE 2016a – DR #1-33, 1-37). The bulk of this backfill material would be placed during the later parts of the Proposed Project. Consistent with EPA (2001) guidelines (see Section 2.3.9 *Import Volumes*) and recommended sampling protocols, which include provisions to ensure that radioactive materials are not brought on site, SCE will use only clean offsite fill materials. Based on the generic impacts evaluated by NRC (2002) in the *Final GEIS on Decommissioning of Nuclear Facilities Supplement* (NUREG-0586) and the analyses described in the EIE (ENERCON 2014), SCE has determined that radiological impacts to soil and groundwater related to fill used during and after decommissioning activities are expected to be well within NRC standards (ENERCON 2014).

Liquid Effluents

After the removal of the SNF to dry storage (to be completed by the end of 2019), SONGS Units 2 and 3 would have remaining liquid effluents associated with the spent fuel pools. As discussed in the Project Description (Section 2.2.3.8, *Water Processing*), the spent fuel pool water would be processed using mechanical filtration, charcoal filters, or via an ion exchange system, to reduce radioactive activity to less than 10 CFR Part 20 limits and then sampled. If the processed water meets discharge limits it would be discharged through the Unit 2 discharge conduit in the same manner that liquid waste was processed while SONGS Units 2 and 3 were operating and in accordance with the facility's National Pollutant Discharge Elimination System (NPDES) permit requirements (SCE 2016a – DR #1-8; see Section 2.2.3.8, *Water Processing*).

SCE will use best management practices (BMPs) to limit or eliminate spills of contaminated liquids. Both the SPCC Plan and a Storm Water Pollution Prevention Plan

would be updated as necessary to address decommissioning activities. Should an unknown area of contamination be identified during sub-grade soil excavation and structures removal, the area would be assessed and controlled. The proposed techniques and BMPs are proven industry practices and are incorporated into SCE plans.

Several major groups of decontamination activities planned during the Proposed Project could involve water and the potential for accidental spills (see Section 2.3, *Proposed Project Activities*):

- Complete radiological remediation pursuant to applicable NRC regulations
- Segment reactor vessel internals and package for shipment and disposal
- Remove and dispose of large components (e.g., Unit 2 and 3 reactor vessels, steam generators, pressurizers, turbine-generators, Unit 1 reactor vessel)
- Dismantle Containment Buildings
- Remove all remaining onshore above-grade structures
- Process wastewater

The HSA documented spills that have occurred at the site, resulting in SONGS drainage systems that are classified as impacted from both a radiological and a non-radiological perspective due to the documented spills, leaks, and releases of radioactive and hazardous materials to the ground surface (AREVA 2015a). The extent and severity of contamination was analyzed in the Site Characterization Report and the reported types and amounts of contaminated liquids at SONGS are limited (AREVA 2015a). The NRC determined that the significance level of potential impacts associated with releases of contaminated liquids was SMALL (ENERCON 2014, see Table 4.1-8) because BMPs for avoiding or containing such releases would effectively limit the likelihood and extent of a release.

Specific decommissioning activities that could impact surface and groundwater quality include decontamination and dismantlement, structure dismantlement, and dewatering. These activities could lead to accidental spills, migration of low concentrations of radioactivity or hazardous substances not previously identified and leaching from abandoned in place concrete subsurface structures (ENERCON 2014). A technique known as hydrolazing (using a high-pressure water jet) is planned to decontaminate steel liner walls in the Spent Fuel Pool and Reactor Pool Cavity. Recycled water (rain and stormwater collected in on-site sumps, which is normally discharged through the offshore conduits) would also be used for dust suppression (See Section 2.3.10~~3~~, *Water Use and Power Supply*). Recycled water could contain low levels of tritium or other radioactive materials at levels below minimum detectable concentrations. As a result, contamination of the ground surface, soil, or groundwater may result from use of a slightly contaminated radioactive material. To avoid contamination of ground surface soil or groundwater, SCE plans to implement strict water chemistry controls, which will ensure contaminated

recycled water is not used for dust suppression. Procedures ~~have been~~would be implemented to support recycling and ensure radioactive material is adequately filtered out or diluted (ENERCON 2014). The methods are derived from and based on established industry practices and are incorporated in NRC-required programs such as the existing Groundwater Protection Program and the Radiation Protection Program, which would be used by the DGC. In-process characterization (i.e., evaluation of the location, type, and level of radioactive and other hazardous materials present) will occur during decommissioning (SCE 2016b). In-process characterization should provide early warnings of detrimental changes (e.g., if removal of impervious surfaces from the site affect groundwater recharge and mobilize existing low-level contaminants).

If any contaminated liquids spill during decommissioning, they would be collected and treated prior to disposal. SONGS Units 2 and 3 systems collect and process radioactive waste so that onsite and offsite exposures are kept within 10 CFR Part 50, Appendix I dose objectives and acceptable limits defined in 10 CFR Parts 20 and 100 (SCE 2016f).

The decontamination and cleanup methods to be used during decommissioning are based on industry-standard practices and procedures that have been successfully implemented by SCE and others on similar projects (Section 2.3, *Proposed Project Activities*), and at the SONGS site during decommissioning of Unit 1. The generic analyses developed by the NRC (2002) in the *Final GEIS on Decommissioning of Nuclear Facilities Supplement* (NUREG-0586) and in the *Final GEIS for Continued Storage of Spent Nuclear Fuel* in interim facilities (NUREG-2157), and the site-specific analyses developed for SONGS decommissioning in the EIE (ENERCON 2014) indicate that radiological releases would be well below applicable standards. Review of the site-specific plans for SONGS (e.g., the PSDAR and related documents), indicates that SCE's decommissioning practices and procedures would be implemented in a manner consistent with the NRC's analyses and findings in the GEIS documents.

In addition to the use of established processes and procedures, decommissioning of the SONGS site and facilities would be accomplished in accordance with NRC requirements to implement programs to reduce radiation to ALARA levels. As discussed above, ALARA programs have been demonstrated industry-wide to provide protection from radiation for workers and the public. Detailed planning and training are essential to reduction of credible threats to personnel and public safety, and result in better process efficiency, increased capacity to adopt new technologies and methods, and more innovation in strategies and products. The ALARA program is required by the NRC and is an industry-accepted practice.

As an example, the SONGS ALARA Program was used during the decommissioning of SONGS Unit 1 from 1999 through 2009. Table 4.1-9 summarizes estimated radiation exposures related to decommissioning activities throughout the duration of the Unit 1 decommissioning project. The dose exposures are considered typical for

decommissioning activities and are well within the release criteria of the *Final GEIS on Decommissioning of Nuclear Facilities Supplement* (NUREG-0586; NRC 2002).

Table 4.1-9. Dose During Decommissioning Activities at SONGS Unit 1

Year	Total Personnel with Measurable Doses	Collective Dose (person-rem)	Average Measurable Dose (rem)
1999	241	15.863	0.07
2000	416	71.214	0.17
2001	338	57.785	0.17
2002	308	61.214	0.2
2003	226	35.596	0.16
2004	169	14.899	0.09
2005	198	20.624	0.1
2006	183	22.49	0.12
2007	20	0.417	0.02
2008	2	0.043	0.02
2009	0	0.000	---

Source: NRC 2011 (NUREG-0713, Attachment C).

The SONGS Radiological Protection Program is based on numerous detailed plans and procedures that are implemented through comprehensive training and certification programs to ensure that employees are qualified and capable of conducting all operations safely and in compliance with applicable regulations, and that they are trained to respond to emergencies to protect workers and the public. The plans, procedures, and other requirements are specified in the SONGS operating license (and other regulatory permits, as appropriate), and the NRC provides regulatory oversight to verify that operations are conducted in compliance.

For example, the SONGS operating license contains extensive radiological training requirements for all personnel who enter Radiological Controlled Areas (RCAs) to ensure that each person who requires access to the RCAs, or who may be involved with radiological activities, understands their responsibility to minimize their own dose and to comply with radiological protection procedures. Per the Radiological Protection Program, training shall include, but not be limited to:

- Effect of radiation and risks associated with radiation exposure (NRC 1996 Regulatory Guide 8.29)
- Individual response to a radiation emergency
- Prenatal radiation dose (NRC 1999, Regulatory Guide 8.13)
- Radiological Controlled Areas and recognition of the associated postings (10 CFR Part 20)
- ALARA philosophy and concepts (NRC 2016d, Regulatory Guide 8.10)

- Radiological protection personnel will meet or exceed the qualifications of ANSI N18.1 -1971 or be formally qualified through a NRC approved training program
- Training for demolition procedures, radiological instrumentation, and programs
- Special briefings and additional training for work with potential for high exposures

SCE must comply with regulations promulgated by California's Division of Occupational Safety and Health (Cal/OSHA) (SCE 2016g). California has a State Plan recognized by the U.S. Occupational and Safety Health Administration (OSHA) (DOL 2017) and is the lead agency in safety requirements. As such, site demolition workers must also have the training courses required by Cal/OSHA. On-site management personnel must have additional supervisory training. All workers involved with hazardous waste operations and emergency response must have an annual refresher if initial training is over 1 year old (Cal/OSHA 2017).

The NRC (2002) concluded in the *Final GEIS on Decommissioning of Nuclear Facilities Supplement* (NUREG-0586) that the radiological impacts of transporting radiological waste from decommissioning would be SMALL (see Table 4.1-8); potential impacts associated with decommissioning Units 2 and 3 are similar to the impacts analyzed in, and are bounded by, this federal environmental document (SCE 2014a). The NRC concludes that the risk associated with truck or rail transportation is very low and well below regulatory standards. The analysis also indicates that rail shipments have lower potential radiological impacts than truck shipments. Disposal facilities available for SONGS Units 2 and 3 radiological wastes are less than half the distance assumed by NRC in its analysis (see Section 2.3.8, *Decommissioning Waste Volumes and Disposal Sites*, for information on waste disposal sites). SCE concluded the generic impacts include those associated with SONGS Units 2 and 3. SCE would comply with: (1) all applicable NRC and U.S. Department of Transportation (DOT) regulations, including Federal Railroad Administration regulations and requirements, and would use approved packaging and shipping containers for waste shipment; and (2) state regulations enforced by the California Department of Transportation (Caltrans) and California Highway Patrol.

In addition to the plans and programs required under the existing SONGS operating license, SCE commits to implementing the following Applicant-proposed measures (APMs) to ensure that impacts from exposure to radioactive materials would be further minimized. Beyond the license-related existing plans and programs and the APMs, there are no feasible MMs that would reduce potential significant effects associated with radiological releases.

APM-1: Waste Management Program. The Applicant ~~and/~~or its contractor shall prepare and implement a Waste Management Program~~ prior to decommissioning~~. The Program shall be submitted to California State Lands Commission staff at least 60 days prior to the commencement of Proposed

Project waste shipment activities. The Program shall include, but not be limited to the following:

- Processes for identification, characterization, handling, transport, and disposal of the various radiological and non-radiological waste types.
- Training for waste management personnel.
- Procedures for documentation of all shipments in accordance with applicable regulations established by the appropriate governing agencies (e.g., Nuclear Regulatory Commission or California Department of Toxic Substances Control) for various radiological and non-radiological waste types.
- Specifications that the Program shall only use qualified and permitted waste disposal carriers and disposal facilities licensed for the specific waste stream to be transported.

APM-4: Dust Suppression (Section 4.3, *Air Quality*).

APM-12: Stormwater Pollution Prevention Plan (SWPPP) (Section 4.9, *Hydrology and Water Quality*).

APM-13: Spill Prevention Control and Countermeasure (SPCC) Plan (Section 4.9, *Hydrology and Water Quality*).

APM-14: Spill Contingency Plan (Section 4.9, *Hydrology and Water Quality*).

Although SCE is required by the NRC operating license to implement detailed plans and procedures to ensure that radiological releases are minimized or avoided, these plans and procedures will not be completed until later in the process and cannot now be reviewed. In addition, due to federal pre-emption, CSLC lacks legal authority over these plans and procedures or the authority to require additional measures. Therefore, there are no feasible MMs that would reduce potential significant effects associated with the release of hazardous radioactive materials during decommissioning and disposal.

Mitigation Measures

No MMs are recommended for Impact HAZ-1.

Residual Impacts

As detailed above, decommissioning activities would be performed subject to federal, state, and local requirements and would incorporate established industry-standard processes and procedures as well as APMs designed to reduce the probability and consequences of accidental releases to the environment. Radiological impacts associated with fugitive dust and contaminated soils during decommissioning activities are expected to be well within NRC standards (ENERCON 2014) and exposures related to liquid effluents within acceptable federal regulatory limits.

Implementation of these processes, procedures, and measures are intended to lower the probability and intensity of impacts associated with the accidental release of hazardous

radioactive materials during decommissioning and disposal to a level that would be considered less than significant by experts in the field. No feasible MMs have been identified by CSLC that would be capable of substantial further reduction of the risk. The NRC has concluded that those impacts that do not exceed permissible levels in their regulations are considered SMALL (see Table 4.1-8). Nonetheless, even though this analysis supports the conclusion that implementation of the Proposed Project's established programs, processes, and procedures would substantially lower the probability that exposure to radioactive materials would occur, there is an inherent risk of radiological exposure at any facility where hazardous radiological materials are present that can never be fully eliminated, and so impacts associated with potential radiological release remain significant and unavoidable.

Impact HAZ-2: Additional Emergency Response Capabilities Required During Decommissioning.

The Nuclear Regulatory Commission (NRC) approved the emergency response capability at SONGS for the current level of risk associated with baseline operations and conditions, and consequences of accident events, and SONGS Units 2 and 3 reactors that are being decommissioned are subject to NRC emergency planning requirements; however, the impact remains potentially significant **(Significant and Unavoidable).**

Impact Discussion

The capability to respond to emergencies during decommissioning is a critical component of the Radiation Protection Program at operating and shut-down nuclear power plants. This Program seeks to ensure employees are qualified and capable of conducting all operations safely and in compliance with regulations and are trained in emergency response (see Section 2.2.3.3, *Radiation Protection Program*). SONGS would maintain the capability to respond to emergencies that could occur during decommissioning, including the ability to effectively mitigate spills, fires, and other accident conditions involving radioactive material. While there is a substantial difference between closed and operating nuclear power plants, particularly related to the types, probability, and consequences of accident events, reactors such as SONGS Units 2 and 3 that are undergoing decommissioning remain subject to NRC emergency planning requirements.

On May 18, 2017, SCE submitted to the NRC the SONGS Permanently Defueled Emergency Plan – Revision 3 (effective April 18, 2017), which requires on-shift personnel to be trained as radiation workers and perform limited radiation protection duties. The revision continues to reflect the reduced risk at the permanently shut down nuclear plant as all irradiated fuel is stored in the Approved ISFSI and in the Spent Fuel Pools. SCE believes that the changes would not reduce the effectiveness of the Permanently Defueled Emergency Plan and the Permanently Defueled Emergency Plan Implementing Procedures (SCE 2017a) (Changes may be made to emergency plans without prior NRC approval under 10 CFR Part 50.54(q) when the effectiveness of the plan is not reduced

(NEI 2004).) SCE anticipates a further reduction of requirements once the fuel is removed from the spent fuel pools, which would be completed by the end of 2019, prior to implementation of any Proposed Project activities involving the FHBs (SCE 2016d).

Most potential accidents related to an operating plant are no longer possible at shutdown nuclear plants after fuel has been removed from the reactor. However, the revised SCE Permanently Defueled Emergency Plan – Revision 3 maintains many of the prior operating emergency planning elements, including around-the-clock, trained emergency personnel on site to address unanticipated events; radiological and environmental monitoring; and drills and close coordination with off-site agencies. The plan, approved by the NRC on November 30, 2017 (NRC 2017c), addresses potential accidents that could occur at SONGS during the Proposed Project in compliance with NRC requirements (SCE 2016b). The NRC has evaluated the radiological impacts of a comprehensive set of postulated accidents and concluded that the impacts are SMALL (NRC 2014, see Table 4.1-8), as described in Section 4.1.4.2, *Radiological Hazards*.

Per the Permanently Defueled Emergency Plan – Revision 3, SCE has primary responsibility for planning and implementing emergency measures within the Exclusion Area Boundary[32] (see Figure 4.13-2) including overall accident assessment. These emergency measures include mitigation, corrective actions, protective measures, and aid for personnel on site. The Permanently Defueled Emergency Plan indicates advance arrangements have been made with off-site organizations for special emergency assistance such as ambulance, medical, hospital, fire, and police services (SCE 2017a).

SONGS does not have authority to evacuate members of the public located beyond the Exclusion Area Boundary (SCE 2018j – DR#7-2). SONGS personnel can make protective action "recommendations" to local officials for the protection of public health and safety, but only government officials and law enforcement have authority to make protective action decisions, such as whether to advise the public to shelter in place or evacuate (SCE 2018j – DR#7-2).

Incidents related to the offsite transport of hazardous materials, including LLRW materials, are addressed by DOT and NRC (10 CFR 71.) regulations. Per NRC training materials, the NRC and DOT share responsibility for the control of radioactive material transport based upon a Memorandum of Understanding. In such incidents, first responders (typically firefighting agencies) use standard response protocols, actual observed meterological conditions, observation of the DOT labeling on the vehicle, and guidance from the DOT Emergency Response Guidebook to assess the situation and

[32] A reactor licensee is required by 10 CFR Part 100.21(a) to designate an exclusion area and to have authority to determine all activities within that area, including removal of personnel and property. For SONGS, the Exclusion Area Boundary is roughly formed by two semicircles with radii of 1,967.5 feet each, centered on the Unit 2 containment dome and a point 134 feet southeast of the Unit 3 containment dome, with a tangent connecting the landward arcs and seaward arcs of the two semicircles (SCE 2017e).

take appropriate actions, including coordination with local law enforcement agencies to evacuate the potentially affected public within the transporation corridor or in nearby buildings, as deemed necessary. (SCE 2018j – DR#7-2)

For fire protection, SCE has a Memorandum of Agreement with the MCBCP Fire Department to support the SONGS Emergency Plans, including emergencies related, but not limited to, radioactive release, hostile action, large-scale fire or natural disaster (e.g., hurricanes, tornados, earthquake or flooding). For SONGS security, details of MCBCP support are in the SONGS Law Enforcement Response Plan. Because this document is classified, details cannot be provided. In general, the MCBCP provides tactical response and their primary role is related to traffic control (SCE 2016a – DR #1-124).

The NRC's Emergency Response, Radiation Protection, and other programs to protect health and safety of workers, the public, and environment include extensive mandatory training programs, as described in the SONGS Permanently Defueled Emergency Plan. This training includes biennial exercises, drills, and specific job-related training:

- **General Employee Training.** Personnel assigned to work at the station with unescorted access receive initial and annual refresher training on general station procedures and policy. This training includes required actions to be taken if an emergency is declared at the station. Personnel assigned to work at the station who do not require unescorted access, including visitors, receive information on the actions to be taken if an emergency is declared at the station.
- **Emergency Response Organization (ERO) Training.** Frequent on-site emergency preparedness drills, including with off-site partners, are conducted. ERO personnel receive initial training and recurring Emergency Plan-related training annually through General Employee Training and position specific training as appropriate (SCE 2016a, Attachment 1-122A). Familiarization by the entire ERO and off-site partners with the potential site hazards, MMs, and their respective roles should aid in mitigating any emergency involving radioactive materials.

Furthermore, annual public and occupational doses must be maintained below the annual dose limits established by 10 CFR Part 72 for the public and 10 CFR Part 20 for occupational personnel. Licensed facilities are also required to maintain an ALARA program, which would likely reduce the doses even further (NRC 2014).

With respect to the existing Approved ISFSI, the NRC has stated "the offsite consequences of potential accidents at an ISFSI…would not warrant establishing Emergency Planning Zones" (60 FR 32435). Additionally, in establishing NRC's Final Rule for emergency planning requirements for ISFSIs and Monitored Retrieval Storage facilities, the NRC responded to comments concerning site-specific emergency planning, including evacuation of surrounding population for an ISFSI not at a reactor site, and concluded that, "The Commission does not agree that as a general matter emergency

plans for an ISFSI must include evacuation planning." (60 FR 32439). (SCE 2018j – DR#7-2)

Although SCE is required by the NRC operating license to implement detailed plans and procedures to ensure that radiological releases due to increases of residual radioactivity concentrations in soil or groundwater are minimized or avoided, these plans and procedures will not be completed until later in the process. In addition, due to federal pre-emption, CSLC lacks legal authority over these plans and procedures or the authority to require additional measures. Therefore, there are no feasible MMs to reduce potential significant effects associated with radiological releases.

Mitigation Measures

No MMs are recommended for Impact HAZ-2.

Residual Impacts

As described above, the risk of accidents at a shutdown nuclear plant are lower than those at an operating plant. Proposed Project decommissioning activities would be conducted subject to federal and state safety and emergency planning requirements and in accordance with detailed plans and programs specifically designed for radiological release prevention, minimization, and response.

Implementation of these precautionary actions would reduce the risk and intensity of impacts associated with potential radiological release. No feasible MMs have been identified that would be capable of substantial further reduction of the risk. However, even the best-designed and implemented plans such as safe design of the facilities, contingency plans, training and drills, and availability of emergency response, cannot completely eliminate risk. Even with accident prevention and emergency response measures in place to prevent and minimize exposure to radioactive materials, impacts associated with potential radiological release remain significant and unavoidable.

Impact HAZ-3: Exposure to Radioactive Groundwater Contamination.

Decommissioning activities may uncover a previously unknown radioactive groundwater plume (or some other groundwater contamination) that could present an additional hazard to workers or the public; therefore, the impact remains potentially significant **(Significant and Unavoidable).**

Impact Discussion

Tritium activity migration was detected in groundwater from the location of the Unit 1 reactor structure in 2006. An investigation determined that low tritium concentrations were present in the shallow groundwater situated generally between the former Unit 1 containment and FHB and extended towards the seawall. Four extraction and 18

monitoring wells were installed, and activity results noted in the Annual Radioactive Effluent Release Reports completed throughout the years. Tritium was also detected in three wells outside the NIA. The extraction pumping rate was reported as 400,000 gallons per month. The water from the extraction wells was managed and discharged through an ODCM-credited release point and accounted for in the liquid effluent releases reported in the Annual Radioactive Effluent Release Reports. As of September 2016, the tritium concentrations were below the LLD values stated in SCE's REMP. Therefore, groundwater extraction has ceased and there are no indications of a tritium rebound (ENERCON 2014; AREVA 2015b; SCE 2015a).

During decommissioning, multiple characterization surveys, including well monitoring, are anticipated as part of the Ground Water Protection Program and the NRC-required Radiation Protection Program. A discovery of a radioactive plume near or in the NIA or in any part of the SONGS Units 2 and 3 areas would create another exposure pathway to workers, and affect how release-criterion DCGLs are developed, as described previously in Section 4.1.1.54, *Radiological Studies*. Certain D&D activities related to subgrade SSCs in SONGS Unit 2 and 3 areas could cause or detect groundwater contamination similar to what was found during the Unit 1 work.

SCE (2016b) commits to the Industry Groundwater Protection Initiative, which identifies actions to improve the nuclear utilities' management and response to instances where inadvertent release of licensed radioactive material may result in low but detectable levels of materials in subsurface soils and water. SCE would continue to monitor effluents, comply with all applicable regulatory limits, continue its REMP to assess the impacts to the environment from these effluents annually, and keep worker exposure levels ALARA throughout SONGS Decommissioning (ENERCON 2014). Continued awareness of this hazard is important throughout decommissioning. The measures required by the NRC-required Radiation Protection Program and Groundwater Protection Program would substantially reduce the likelihood of inadvertent exposure of workers or the public to pre-existing radiological contamination and prevent additional radiological groundwater contamination.

The NRC operating license requires SCE to implement detailed plans and procedures to ensure that radiological releases due to increases of residual radioactivity concentrations in soil or groundwater are minimized or avoided; however, these plans and procedures cannot be completed until later in the process. In addition, due to federal pre-emption, CSLC lacks legal authority over these plans and procedures or the authority to require additional measures. Therefore, there are no feasible MMs that would reduce potential significant effects associated with radiological releases.

Mitigation Measures

No MMs are recommended for Impact HAZ-3.

Residual Impacts

As described above, existing effluent monitoring would continue, and NRC-required Ground Water and Radiation Protection Programs would be implemented, along with industry-standard practices to contain existing contamination and prevent new radiological groundwater contamination. No feasible MMs have been identified that would be capable of substantial further reduction of the risk. However, even the best-designed and implemented plans cannot eliminate all risk, and so even with implementation of the Proposed Project's established programs, processes, and procedures to prevent exposure to radioactive materials, impacts associated with potential radiological release through groundwater contamination remain significant and unavoidable.

4.1.4.3 Non-Radiological Hazardous Waste

Because the potential for spills and leaks of non-radiological hazardous materials previously existed during operation, and large volumes of diesel fuel and other hazardous chemicals have been removed from the site (SCE 2016h), the risk of increased spill frequency and volume during decommissioning has been reduced. This analysis also considers potential impacts related to a release of hazardous materials by spills and leaks during decommissioning, creating a fire or explosion hazard to the public, or a release of hazardous substances that threaten the public.

Impact HAZ-4: Handling of Non-Radiological Hazardous Wastes.

The Proposed Project could substantially increase risk above existing baseline conditions and create a substantial hazard to the public through the use or disposal of hazardous materials **(Less than Significant with Mitigation).**

Impact Discussion

Non-radiological hazardous waste generated during the Proposed Project would be stored and managed at the existing hazardous waste management facility (SYFA). The facility's Hazardous Materials Business Plan (APM-2) details the hazardous materials inventory for the site, emergency contacts, a site plan, and response strategies; and procedures for on-site refueling (refueling stations and fuel tanks locations, maintenance, and operation). Removal of hazardous wastes (e.g., asbestos and lead-based paint from buildings and contaminated soil excavated from underground storage tank sites) as addressed in the Waste Management Program (APM-1) may temporarily require increased use of the hazardous waste facility to handle, characterize, and transport the waste to approved disposal facilities (see Section 2.3.8, *Decommissioning Waste Volumes and Disposal Sites*, for information on waste disposal sites). Transport by rail or truck of hazardous materials would increase temporarily but would not significantly affect public health. Public access to SONGS is restricted and site activities related to hazardous materials handling at the site during decommissioning would not affect the

general public. All hazardous material handling, transport, and disposal would be subject to existing DOT and SONGS facility hazardous waste permit requirements.

The SONGS facility hazardous waste permit outlines the location, storage methods, and volumes for temporary storage (one year maximum) of hazardous waste (CalEPA and DTSC 2016). DTSC issued the RCRA-equivalent Hazardous Waste Facility Permit to Southern California Edison which~~that~~ is effective May 23, 2016, through May 23, 2026. Due to timing of decommissioning, the Permit may require extension (**MM HAZ-4**). The Facility Permit identifies the following facility units for treatment and storage of RCRA and non-RCRA hazardous waste: HazMat Area-South Yard Facility Sections A and B (storage in sealed containers, combined capacity of 46,150 gallons), Multi-purpose Handling Facility: Low Specific Activity Waste Area (storage of sealed containers in an enclosed reinforced concrete building, maximum capacity 8,050 gallons), and Multi-purpose Handling Facility High Specific Activity Waste Area (storage in sealed containers, maximum capacity of 8,050 gallons). DOT regulations require the generator (SCE EPA ID Number CAD000630921) and transporter to have EPA Identification Numbers and that all waste is transported with a Uniform Hazardous Waste Manifest.

SCE commits to the following APMs to reduce the impacts associated with hazardous materials, but not to a less-than-significant level.

APM-1: Waste Management Program.

APM-2: Hazardous Materials Business Plan (HMBP). The existing HMBP shall continue to be updated as required by law and as prescribed by the County of San Diego, Department of Environmental Health, Hazardous Materials Division (County HMD), but not less than annually. The Plan shall include:

- A detailed hazardous materials inventory for the site
- Emergency contacts, a site plan, and response strategies
- Procedures for on-site refueling (refueling stations and fuel tanks locations, maintenance, and operation

The HMBP shall be uploaded to the California Environmental Reporting System per County HMD requirements, and the certified document submitted to California State Lands Commission staff at least 30 days prior to the commencement of Proposed Project decontamination and dismantlement activities and annually thereafter while Proposed Project activities are occurring.

Mitigation Measures

With implementation of **MM HAZ-4**, the impact related to handling of non-radiological hazardous wastes would be reduced to a less-than-significant level.

MM HAZ-4: Facility Hazardous Waste Permit Extension. The Applicant ~~and/~~or its contractor shall coordinate with the California Department of Toxic Substances Control to ~~add all decommissioning activities to the existing facility permit and~~ obtain time extensions or amendments to the Hazardous Waste Facility Permit

as necessary~~ until all regulated waste is removed from the site~~. A copy of the Hazardous Waste Permit Extension shall be provided to the California State Lands Commission 2 weeks prior to the ~~start of decommissioning activities~~expiration of the existing Hazardous Waste Facility Permit.

Impact HAZ-5: Risk of Fire, Explosion, or Hazardous Material Release.

The Proposed Project could substantially increase risk above existing baseline conditions related to fire, explosion, or release of flammable or toxic materials, and may create a substantial hazard to the public **(Less than Significant with Mitigation).**

Impact Discussion

Decommissioning would require cutting and demolition of structures that may include asbestos or lead paint. Asbestos containing building materials would be removed in accordance with California Occupational Safety and Health Administration requirements, Cal/OSHA worker registration policies, and standard practice and construction safety orders of the California Department of Industrial Relations (DIR). Structures with lead-based paint would require removal of the paint prior to cutting, torching, or demolition in accordance with DIR regulations. Oil sumps and underground storage tanks containing oil, diesel fuel, or other hazardous fluids would also be removed. Hazardous chemicals contained in storage tanks (above or below ground) would be removed by pumping the contents into an approved tank or truck for proper transport and disposal.

In addition, during Proposed Project activities, hazardous materials such as vehicle fuels, oil, hydraulic fluid, and other vehicle maintenance fluids would be used and stored in staging yards. Gasoline, diesel fuel, oil, hydraulic fluid, lubricants, solvents, and cleaning chemicals used in deconstruction activities, equipment, and vehicles could be released during decommissioning from accidents or leaking equipment or vehicles. Spills and leaks of hazardous materials could result in soil or groundwater contamination. Leaks from equipment used offshore (barges and cranes) for partial removal of the offshore conduit components could adversely affect marine waters, as discussed in Section 4.9, *Hydrology and Water Quality*, Impact WQ-3.

Removal of hazardous substances prior to demolition in accordance with standard practices, and the use of safety equipment, would minimize the potential for an increased risk of fire, explosion, and hazardous material release. These issues would be addressed in the proposed Waste Management Program (APM-1).

The updated SONGS SWPPP (APM-12), the SPCC Plan (APM-13), and the Spill Contingency Plan (APM-14) would be used during Proposed Project activities. Implementation of these plans would reduce the likelihood of spills through implementation of several measures including: proper storage and handling procedures, standard hazardous waste transport, training of personnel, procedures for fueling and

maintaining construction equipment, and an emergency response program to ensure quick and safe cleanup of accidental spills. The measures provided in the SWPPP would reduce the potential for spills to occur through implementation of protocols for storage, transport, and handling of hazardous materials on site for the proposed deconstruction activities. Adherence to these plans would avoid significant impacts related to possible hazardous waste spills.

SCE commits to the following APMs to ensure that impacts from hazardous materials would be minimized (see Section 4.9, *Hydrology and Water Quality*).

APM-1: Waste Management Program.

APM-12: Stormwater Pollution Prevention Plan (SWPPP) (Section 4.9, *Hydrology and Water Quality*).

APM-13: Spill Prevention Control and Countermeasure (SPCC) Plan (Section 4.9, *Hydrology and Water Quality*).

APM-14: Spill Contingency Plan (Section 4.9, *Hydrology and Water Quality*).

With the inclusion of APM-1, APM-12, APM-13, and APM-14, impacts from hazardous materials release would be reduced, but not to a less-than-significant level.

Mitigation Measures

With implementation of **MM HAZ-5**, the impact related to fire, explosion or hazardous material release would be reduced to a less-than-significant level.

MM HAZ-5: Worker Registration/Certification. The Applicant ~~and/~~or its contractor shall require workers ~~to have the required registrations to~~ removinge asbestos, lead-based paint, and other hazardous materials to have the required registrations. The Applicant or its contractor shall submit a list of all workers with certification records to California State Lands Commission staff 60 days prior to the ~~start of demolition~~implementation of applicable activities, and a list every 60 days thereafter, as long as the work requiring such certifications is occuring.

Impact HAZ-6: Mobilization of Existing Contaminants.

The Proposed Project could mobilize existing soil or groundwater contamination and expose workers to hazardous materials **(Less than Significant with Mitigation).**

Impact Discussion

During removal of below ground structures and adjacent soil, contaminated soil and groundwater may be encountered. Groundwater occurs at approximate elevation +5 feet Mean Lower Low Water (MLLW) and may be encountered in shallow excavations in the NIA (ground surface +20 feet). Shallow excavations in the NOCA (elevation +30 to +50 feet) at the former gasoline UST site, dry cleaner, and hydraulic oil releases (mechanical

bollards) are unlikely to encounter groundwater. Similarly, shallow excavations in other facility areas at elevations higher than +30 feet are unlikely to encounter groundwater. Contaminated soil may be encountered below asphalt, where leaks and spills have reached the underlying soil. Limited data exist that support evidence of shallow (less than 5 feet) soils having been contaminated by TPH (diesel, oil) and VOCs (solvents). Unanticipated soil contamination could exist in many areas of the SONGS facility and include gasoline and diesel fuel residuals, heavy metals, solvents, oil, PCBs, or other hazardous materials.

While the required SWPPP (APM-12) would partly address the excavation, handling, and disposal of contaminated soil, additional mitigation is required to fully protect workers from unknown soil contamination. If field screening and laboratory data are not properly interpreted, environmentally contaminated soil could be improperly handled and disposed of, resulting in additional environmental contamination or exposure of workers to non-radioactive contaminated materials.

SCE commits to the following APM to reduce impacts from hazardous materials (see Section 4.9, *Hydrology and Water Quality*).

APM-12: Stormwater Pollution Prevention Plan (SWPPP) (Section 4.9, *Hydrology and Water Quality*).

With the inclusion of APM-12 impacts from the mobilization of existing contaminants would be reduced, but not to a less-than-significant level.

Mitigation Measure

Implementation of **MM HAZ-6** would mitigate much of the Proposed Project's adverse impacts related to unknown contaminated soil and groundwater, and worker exposure to hazardous chemicals.

MM HAZ-6: Soil and Groundwater Site Characterization ~~Study~~ and Soil Management Plan. The Applicant or its contractor shall prepare a comprehensive Site Characterization ~~Study~~ and Soil Management Plan for non-radiological contamination testing, which shall include:

- Subsurface soil and groundwater sampling, after site safety constraints have been addressed (i.e., underground utilities deactivated or removed).
- An investigation work plan, including boring and sampling locations, to investigate where known and suspected soil and groundwater contamination may be present.
- Identification of the limits of contamination based on the results of the soil and groundwater testing, and procedures to protect workers during excavation, handling, and disposal of materials exceeding regulatory limits.
- A Soil Management Plan for the identification and disposal of potentially contaminated soil, which shall:

- Consider that some contaminated soil may be present outside the limits identified in the soil characterization study.
- Include the required qualifications for professionals who shall monitor soil conditions, conduct soil sampling, coordinate laboratory testing, oversee soil excavation and disposal, determine the anticipated field screening methods, and appropriate regulatory limits.
- Contain requirements for documentation and reporting of incidents of encountered contaminants, such as documenting locations of occurrence, sampling results, and reporting actions taken to remediate non-radiological contaminated materials.

The Applicant or its contractor shall submit the ~~Study and~~ Plan to California State Lands Commission staff a minimum of 60 days prior to ~~decommissioning~~ the start of Proposed Project activities, for review. In addition, ~~monthly~~ quarterly soil ~~monitoring~~ sampling reports shall be submitted to the County of San Diego, Department of Environmental Health, Hazardous Materials Division.

4.1.5 Cumulative Impacts

Projects that could cause a cumulative impact that could exacerbate impacts associated with the Proposed Project include any projects that could increase the risks of radiological exposures to workers, the public, or environment. As discussed in Section 3.2, *Relevant Cumulative Projects*, and shown in Table 3-2, 14 reasonably foreseeable cumulative projects fall within the geographic area near SONGS considered for potential cumulative impacts related to hazardous and radiological materials.

Construction and continued operations of the Approved ISFSI, including the transfer of SNF from wet storage is also discussed in Section 3.2.1, *SONGS Independent Spent Fuel Storage Installation* ~~*Expansion*~~ (see also Cumulative Projects ID No. 1 in Table 3-2). Construction of the Holtec portion of the Approved ISFSI ~~expansion~~ was completed on January 19, 2018. The NRC (2014) examined the risks of routine operations for long-term storage in NUREG-2157 (the GEIS for Continued Storage of Spent Nuclear Fuel) and found radiological risks associated with long-term storage (either at-reactor or away-from-reactor) would be small and in compliance with regulatory standards. The plan and schedule for the management of SNF and HLW during SONGS decommissioning are based on assumptions consistent with the Nuclear Waste Policy Act and Standard Contracts that provide a defensible basis for projections of the activities and time required to complete decommissioning (See Appendix D1, *Management, Storage, Transportation, and Disposal of Spent Nuclear Fuel and High-Level Waste at San Onofre Nuclear Generating Station*).

As part of a lawsuit a Settlement Agreement (*Citizens Oversight, Inc./Patricia Borchmann, v. the California Coastal Commission/Southern California Edison Company*), SCE must use “commercially reasonable efforts” to relocate SONGS SNF to an off-site storage

facility (see Section 1.2.2.3, *Settlement Agreement*). Under this Settlement Agreement, SCE will develop, with input from a team of expert consultants, a Transportation Plan and Strategic Plan for transportation and off-site storage of SNF. However, because these Plans are not yet available at the time of preparation of this EIR, and because the timing of repository availability is uncertain, this discussion relies on a NRC study that analyzed potential environmental impacts over three possible timeframes: a short-term timeframe, which includes 60 years of continued storage after the end of a reactor's licensed life for operation; an additional 100-year timeframe (60 years plus 100 years) to address the potential for delay in repository availability; and a third, indefinite timeframe to address the possibility that a repository never becomes available. Potential impacts for areas important to radiological hazards were analyzed by the NRC for each of the three possible timeframes (see Table 4.1-10).

Table 4.1-10. NRC Summary of Impacts of Continued At-Reactor Storage

Category		Storage		
		Short-Term	Long-Term	Indefinite
Waste Management	LLW	SMALL	SMALL	SMALL
	Mixed Waste	SMALL	SMALL	SMALL
Transportation	Traffic	SMALL	SMALL	SMALL
	Health Impacts	SMALL	SMALL	SMALL
Public/Occupational Health		SMALL	SMALL	SMALL
Accidents		SMALL	SMALL	SMALL
Sabotage or Terrorism		SMALL	SMALL	SMALL

Source: NRC 2014 (NUREG-2157, Table 4-2), also see Table 4.1-8.

Although the NRC determined that the likelihood of impacts of long-term storage is very small, public concern exists about the potential for radiological releases for short-term storage of SNF because ISFSI technology is relatively new and has not been tested for timeframes beyond a few decades. Such concern would increase the longer on-site storage remains and final site restoration and Final Status Survey are delayed beyond the current plan. Information on topics such as ISFSI technology, dry cask storage, and SNF transport (such as presented in Appendix D3, *Spent Nuclear Fuel Transportation Experience and Risk Assessments*) should be routinely provided to the public, and open and transparent communication should continue via the SONGS Community Engagement Panel or other forums.

After the Proposed Project has been completed (estimated 2035), the CCC would determine if the Approved ISFSI may be retained in its current location or removed or relocated. If the Approved ISFSI is permitted to remain on site, activities would include continued routine operation and maintenance. Impacts associated with continued operations and maintenance could include those similar to HAZ-1 and HAZ-4.

No other potential cumulative projects (see Section 3.2, *Relevant Cumulative Projects*) uses radiological materials. As a result, no reasonably foreseeable scenarios could result

in the Proposed Project contributing to significant cumulative impacts that would affect the analyses presented above or present a cumulative risk to any receptors. With regard to non-radiological hazards, SONGS Mesa Environmental Investigation and Remediation (Cumulative Projects ID No. 3) is returning three of five parcels at the SONGS Mesa Facility (north of SONGS and east of I-5) to the DoN. Buildings not needed by DoN have been demolished on Parcels 5, 6, and 7 and site cleanup has been completed at Parcel 5. Site investigation including soil sampling is underway at the other two parcels. Low-level VOC contamination was identified at Parcel 6. Excavation and removal of contaminated soil are not anticipated to be completed before the Proposed Project starts (CCC 2016a) and no cumulative impact related to hazardous waste disposal would occur. The SONGS Riprap and Public Access Walkway Repairs Project (Cumulative Projects ID No. 6) is completed. Therefore, the Proposed Project would not make a considerable contribution to cumulative effects associated with non-radiological hazardous materials.

4.1.6 Future Activities

Future Activities include the packaging and off-site transportation of SNF and HLW, Approved ISFSI removal, the removal of Unit 1 remnants below the Approved ISFSI, and final site restoration activities. Appendix D3, *Spent Nuclear Fuel (SNF) Transportation Experience and Risk Assessments*, provides additional details regarding the actions that would be required to remove SNF and HLW from SONGS, and transport it to a disposal or storage facility off site. Transport of the SNF and Class A waste to a new location may result in potential impacts similar to those described in HAZ-1. If future activities have the potential to result in accidental spills of hazardous materials, implementation of measures similar to APM-1, APM-12, APM-13, and APM-14 would be appropriate.

NRC has analyzed the risks associated with transportation and found the risk from routine transportation activities would be SMALL (see Table 4.1-8). In addition, the DOE analyzed the radiological risks associated with the transport of SNF nationwide in the Environmental Impact Statement (EIS) for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada (DOE 2002). DOE's analysis included specific transportation routes (including both rail and highway) from reactors (including SONGS) to the repository. DOE also found that radiological risks associated with transportation would be small. This report was supplemented by the NRC in 2016. The NRC's 2016 supplement assessed the potential for cumulative impacts associated with other past, present, or reasonably foreseeable future actions. The NRC staff found that the potential direct, indirect, and cumulative impacts on the resources evaluated in this supplement would be also be SMALL (NRC 2016e, see Table 4.1-8).

After all SNF has been shipped off site, final site restoration activities that are contingent on removal of the Approved ISFSI could take place, in addition to any activities needed for final NRC license termination (SCE 2016d). With removal of the SNF, the probability

of radiological exposures would be greatly reduced. Upon completion of decommissioning, SCE must complete a Final Status Survey to determine whether residual radioactivity is reduced to a level that permits license termination. The License Termination Plan must be submitted at least 2 years before the planned termination date.

The remaining Unit 1 components are within the NIA. On December 15, 1998, SCE submitted a PSDAR for Unit 1, to commence DECON in 2000.[33] SCE performed physical D&D activities and removed and disposed of most of the Unit 1 SSCs between 2000 and 2008. Certain below-grade structures were abandoned in place and any void spaces filled. SCE then constructed the original Approved ISFSI for the temporary storage of SONGS Unit 1 SNF. The fuel from Unit 1 was transferred to the Approved ISFSI in 1993 (NRC 2016b). Remnant subsurface structures and soil which contain residual contamination, as well as the Unit 1 reactor vessel remain in the NIA (see Table 2-2) (SCE 2016d). NRC issued a license amendment in 2010 releasing the offshore portions of the Unit 1 cooling intake and outlet pipes under the Pacific Ocean seabed, leaving them in place for unrestricted use. SONGS Unit 1 decommissioning work yet to be completed includes the disposal of the Unit 1 reactor vessel package (currently stored in the NIA), and demolition of the Unit 1 share of the Approved ISFSI after the SNF is removed.

The following presents the characterization and condition of the Unit 1 SSC and below grade soil (AREVA 2015a):

- **Below Grade Foundations.** SCE did not remove all below grade structures. Foundation structure remnants that remain at least 10.5 feet below grade include the containment building concrete foundation, turbine building foundation mat and anchor blocks, and auxiliary building and SNF building foundations.
- **Below Grade Embedded Piping.** Contaminated floor drains, embedded piping, and expansion joint material were left behind in the turbine building foundation mat, in the circulating water inlet piping (anchor block 1), and the circulating water outflow piping (anchor block 2). The reheater pit sump was also left behind. These radioactive contaminated materials were surveyed, then the embedded piping ends were grouted. The reported radionuclides of concern were cesium (Cs)-134, Cs-137, cobalt (Co)-60, and tritium. Cs-137 was the dominant contributor.
- **Below Grade Soil.** Most results were reported as no detectable license radioactive material. Any results that were greater than the minimum detectable activity were a small fraction of the NRC screening levels, except for the Class 1 Reactor Coolant System (RCS) chemistry sample line area, part of the Control and Administrative Building survey unit. Of 43 Final Status Survey samples collected,

[33] Licensees may choose from three decommissioning strategies: DECON, SAFSTOR, or ENTOMB. Under DECON (immediate dismantling), soon after the nuclear facility closes, equipment, structures, and portions of the facility containing radioactive contaminants are removed or decontaminated to a level that permits release of the property and termination of the NRC license.

18 showed no detectable licensed radioactive material. The remaining 25 soil samples with positive results showed Cs-137 concentrations ranging from 0.2 picocuries per gram (pCi/g) to 15 pCi/g, with an average Cs-137 concentration of about 2 pCi/g. This average concentration is approximately 20 percent of the NRC screening value for Cs-137 in soil (11 pCi/g).

Removal of the solid covers on the mammal exclusion barriers of the Unit 2 discharge conduit and, if required by the Commission, removal of remaining discharge conduit diffuser ports, could result in impacts similar to those discussed in Impact HAZ-5. Per the radiological scoping survey performed by CB&I of the Unit 2 and Unit 3 discharge conduit interior surfaces and offshore sediment adjacent to the discharge diffuser port locations, two plant-related radionuclides, Cs-137 and Co-60, were detected inside the discharge conduits. These sample results are consistent with data reported to regulatory agencies in SONGS Radioactive Effluent Reports (SCE 2015e; SCE 2016m) and were below the NRC's regulatory thresholds. One plant-related radionuclide, Co-60, was also detected in ocean bottom sediment samples collected near the discharge diffuser ports and conduit displacements. Future Activities would occur after 2035, when the radioactive half-life will cause concentration levels to be reduced significantly through radioactive decay. The NRC will ultimately determine if any resampling or analysis may be required. Decommissioning of the discharge conduit diffuser ports would be accomplished in accordance with the NRC's requirement to implement programs to ensure radiation reduction to ALARA levels. Implementation of measures similar to APM-1 may be appropriate.

Future Activities would also include disposition of the seawall, public beach access walkway, and shoreline rock riprap; their final end-state condition would require approval of the DoN, CCC, and other applicable agencies. As proposed, the Applicant intends to remove exposed rock riprap to -2 MLLW. Potential impacts may be similar to Impacts HAZ-4 and HAZ-6. These activities would not likely result in encountering hazardous materials and, therefore, impacts are unlikely to occur. Implementation of Future Activities could result in hazardous materials impacts similar to those discussed for the Proposed Project and would undergo environmental analysis by government agencies with jurisdiction over the Future Activities.

4.1.7 Summary of Proposed Mitigation Measures

Table 4.1-11 provides a summary of the mitigation and Applicant-proposed measures.

Table 4.1-11. Hazardous and Radiological Materials Impact/Mitigation Summary

Impact	MM/APM
HAZ-1: Release of Hazardous Radioactive Materials during Decommissioning and Disposal	APM-1: Waste Management Program APM-4: Dust Suppression APM-12: Stormwater Pollution Prevention Plan (SWPPP)

Table 4.1-11. Hazardous and Radiological Materials Impact/Mitigation Summary

Impact	MM/APM
	APM-13: Spill Prevention Control and Countermeasure (SPCC) Plan APM-14: Spill Contingency Plan
HAZ-2: Additional Emergency Response Capabilities Required during Decommissioning	None recommended
HAZ-3: Exposure to Radioactive Groundwater Contamination	None recommended
HAZ-4: Handling of Non-Radiological Hazardous Wastes	APM-1: Waste Management Program APM-2: Hazardous Materials Business Plan MM HAZ-4: Facility Hazardous Waste Permit Extension
HAZ-5: Risk of Fire, Explosion, or Hazardous Material Release	APM-1: Waste Management Program APM-12: Stormwater Pollution Prevention Plan (SWPPP) APM-13: Spill Prevention Control and Countermeasure (SPCC) Plan APM-14: Spill Contingency Plan MM HAZ-5: Worker Registration/Certification
HAZ-6: Mobilization of Existing Contaminants	APM-12: Stormwater Pollution Prevention Plan (SWPPP) MM HAZ-6: Soil and Groundwater Site Characterization ~~Study~~ and Soil Management Plan

4.2 AESTHETICS

This section describes the Area of Visual Effect (AVE) for the Proposed Project including critical public views (see Figure 4.2-1), identifies applicable significance thresholds, assesses the Proposed Project's impacts to aesthetics and their significance, and recommends measures to avoid or substantially reduce any effects found to be potentially significant. The environmental setting for aesthetics in this Environmental Impact Report (EIR) is based on information obtained from the Project Description, documents authored by the Marine Corps Base Camp Pendleton (MCBCP) and Nuclear Regulatory Commission (NRC), and other federal and state agencies.

Two components of the AVE are: (1) the sensitivity of critical public views most affected by Proposed Project actions due to viewer proximity to the Proposed Project Site, visibility of the affected view, and Proposed Project duration; and (2) the Visual Modification Class (VMC), which is a measure of the existing visual conditions of the AVE and the extent to which alterations within the AVE would be noticeable to the public.

4.2.1 Environmental Setting

The Proposed Project site is situated along the Pacific Ocean within and offshore the MCBCP. The ~~o~~Onshore ~~s~~Site is dominated by the two containment domes for the San Onofre Nuclear Generating Station (SONGS). Public access to the MCBCP, which consists of developed camp areas and mostly undeveloped training areas, is limited (MCBCP 2012, 2016a). The site is near several scenic areas, including San Onofre State Beach, which consists of 3,127 acres that extend across four separate subunits (California Department of Parks and Recreation [DPR] 1984). The following two subunits adjacent to SONGS are within the Proposed Project's AVE (the area in which the Proposed Project would be visible): (1) the Surf Beach subunit to the northwest, which includes approximately 1.3 miles of coastal area; and (2) the Bluffs subunit to the southeast, which includes approximately 3.4 miles of coastal area (DPR 1984). Existing structures at SONGS are also partially visible from Interstate [I-] 5 and Old Pacific Highway (Old Highway 101) inland of the site, and nearby beach and shoreline vantage points. The Pacific Coast Bike Route traverses the AVE along Old Pacific Highway, through the Surf Beach and Bluffs subunits of San Onofre State Beach and along the northern boundary of SONGS.

4.2.1.1 Sensitivity of Critical Public Views

Identifying critical public views relies on the concept that sensitivity is more a function of a viewer's expectations, activities, awareness, values, and goals, which determine the viewer's favorable or unfavorable response to their environment, than the view's aesthetic appeal (U.S. Department of Transportation [DOT] 2015). Defining the visual quality for an AVE requires identifying what viewers like or dislike about the visual character of that

Figure 4.2-1. Critical Public Views



Source: SCE – basemap and footprint.

AVE. The importance of the affected landscape is inferred from the following indicators of sensitivity.

High Sensitivity suggests that some part of the public would react strongly to a threat to visual quality. Concern is expected to be great because the affected views are unique, rare, or otherwise special to the region or locale. A highly concerned public is assumed to be more aware of any level of adverse change and less tolerant than a public that has little concern. A small modification of the existing landscape may be visually distracting to a highly sensitive public and represents a substantial reduction in visual quality.

Moderate Sensitivity suggests that the public would probably voice some concern over substantial visual impacts. Often the affected views are secondary in importance or are similar to others commonly available to the public. Noticeably adverse changes would probably be tolerated if the essential character of the views remains dominant.

Low Sensitivity is considered to prevail where the public is expected to have little or no concern about changes in the landscape. This may be because the affected views are not “public” (inaccessible to the public) or because there is no indication that the affected views are valued by the public. For instance, little public concern for aesthetics is assumed to pertain to views from industrial, commercial, and purely agricultural areas, with some exceptions (e.g., some agricultural areas are prized for their open space value, and views of such are highly sensitive). Visual sensitivity is considered low for views from all sites, areas, and travel routes not identified as moderate or high in sensitivity.

4.2.1.2 Visual Modification Class

The VMC is a measure of the existing quality of the affected setting, which is determined by how noticeable incongruous features may be within public views. Table 4.2-1 defines the four VMCs used to determine aesthetic impacts in the AVE.

Table 4.2-1. VMC Definitions

VMC	Definition
1	Not Noticeable. Changes in the landscape are within the field of view but generally would be overlooked by all but the most concerned and interested viewers; they generally would not be noticed unless pointed out (inconspicuous because of such factors as distance, screening, low contrast with context, or other features in view, including the adverse impacts of past activities).
2	Noticeable, Visually Subordinate. Changes in the landscape would not be overlooked (noticeable to most without being pointed out); they may attract some attention but do not compete for it with other features in the field of view, including the adverse impacts of past activities. Such changes often are perceived as being in the background.
3	Distracting, Visually Co-Dominant. Changes in the landscape compete for attention with other features in view, including the adverse impacts of past activities (attention is drawn to the change about as frequently as other features in the landscape).

VMC	Definition
4	Visually Dominant, Demands Attention. Changes in the landscape are the focus of attention and tend to become the subject of the view; such changes often cause a lasting impression on the affected landscape.

Note: VMC definitions are adapted from U.S. Bureau of Land Management Manual 8431 (BLM 1986).

4.2.1.3 Determining the Area of Visual Effect

To determine the visual quality of the AVE, a range of "Critical Public Views" (areas from which the existing SONGS facility can be seen that are accessible to the public and are recognized for their aesthetic values) that may be affected by the Proposed Project is identified in Table 4.2-2 (see Figure 4.2-1). Given the primary function of MCBCP is to provide military training, and its limited public access, Critical Public Views are not identified within the restricted areas of the MCBCP.

Table 4.2-2. Critical Public Views

Viewpoint	Sensitivity	VMC
San Onofre Bluffs. This subarea within San Onofre State Beach is recognized for its beautiful sandstone bluffs and views of the ocean (DPR 2017b). It offers camping and day-use parking along Old Pacific Highway. Views from these bluffs belong to the high sensitivity classification due to the site's designated recreational use and the overall high visual value of the surrounding coastal area to recreationists. The existing SONGS facility is a "Distracting, Visually Co-Dominant" use within the landscape for San Onofre Bluffs. While the facility does not impede southern and eastern coastal views from the Bluffs, it is a dominant feature in the landscape that competes with the Bluffs' western coastal views.	High	3
San Onofre Surf Beach. This subarea within San Onofre State Beach is recognized as a world renowned and historical surf break (DPR 2017b). It is accessible to the public as a "day-use only" site. Views from this beach belong to the high sensitivity classification due to the site's designated recreational use and its established popularity as a surf spot. The existing SONGS facility is a "Distracting, Visually Co-Dominant" use within the landscape for San Onofre Surf Beach. While the facility does not impede southern and western coastal views at Surf Beach, it is a dominant feature in the landscape that competes with the beach's eastern coastal views.	High	3
Pacific Coast Bike Route. The bike route along Old Pacific Highway is a popular recreational use through San Onofre State Beach, connecting the Surf Beach and Bluffs subunits. Views from the bike route belong to the high sensitivity classification due to the frequent public use of this route and to its proximity to the coast. The existing SONGS facility is a "Visually Dominant, Demands Attention" use within the landscape for the Pacific Coast Bike Route. The SONGS facility is nearer the bike route than the coastal resources that serve as the attraction for bicyclists using this route.	High	4
Public Beach Access Walkway. The public walkway is located along the seawall that extends between the Onshore and Offshore Proposed Project components along the beach immediately south of SONGS. The walkway allows pedestrian transit between open beach areas up- and down-coast	High	4

Viewpoint	Sensitivity	VMC
from the Proposed Project site. Views from this public access walkway belong to the high sensitivity classification due to the critical nature of this site as a primary access point maintaining coastal access along the shore. The existing SONGS facility is a "Visually Dominant, Demands Attention" use within the landscape for the public access walkway as it restricts views of the surrounding coastal landscape.		

4.2.2 Regulatory Setting

Relevant federal and state laws, regulations, and policies that pertain to the Proposed Project are summarized in Appendix A. Local regulations and policies relevant to aesthetics are found in the County of San Diego General Plan Conservation and Open Space (COS) Element related to the conservation and management of scenic corridors and other natural resources. The portion of I-5 through the Proposed Project AVE is a County Designated Scenic Highway (County of San Diego 2011). The following County policies pertain to the preservation of scenic resources:

- **COS-11.1: Protection of Scenic Resources** – Protect scenic highways, corridors, regionally significant scenic vistas, and natural features, including prominent ridgelines, dominant landforms, reservoirs, and scenic landscapes
- **COS-11.4: Collaboration with Agencies and Jurisdictions** – Coordinate to protect scenic resources and corridors that extend beyond the County's land use authority, but are important to the welfare of County residents
- **COS-13.3: Collaboration to Retain Night Skies** – Coordinate to retain the quality of night skies by minimizing light pollution

4.2.3 Significance Criteria

The significance criteria used to evaluate the Proposed Project's impacts to aesthetics are based on Appendix G of the State CEQA Guidelines. According to Appendix G of the State CEQA Guidelines, a significant impact would occur if the Proposed Project would:

- Have a substantial adverse impact on a scenic vista.
- Substantially damage scenic resources, including trees, rock outcroppings, or historic buildings within a scenic highway.
- Substantially degrade the existing visual character or quality of the site and its surroundings, where substantial for this EIR is defined as a perceptible reduction of visual quality, lasting for more than 1 year that is seen from moderately to highly sensitive viewing positions (a perceptible reduction of visual quality occurs when, for a highly sensitive view, the visual condition is lowered by at least one VMC or, for a moderately sensitive view, the condition is lowered by at least two VMCs).

- Create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area.

4.2.4 Environmental Impact Analysis and Mitigation

The aesthetic impact analysis focuses on the foreseeable visible changes during and after the proposed decontamination and decommissioning (D&D) activities at critical public viewpoints within the Proposed Project's AVE (see Table 4.2-2 above). Table 4.2-3 at the end of this section summarizes the Proposed Project-related aesthetic impacts.

ENVIRONMENTAL IMPACT ANALYSIS

Impacts of the proposed Project and recommended mitigation measures (MMs) and Applicant-proposed measures (APMs) are examined in this section.

Impact AES-1: Affect a Scenic Vista.

The Proposed Project improves the aesthetic features of the surrounding landscape **(Beneficial).**

Impact Discussion

D&D activities would require a variety of equipment ~~during Phase 1~~. As many demolition activities would occur in parallel, multiple types of construction equipment would be on site simultaneously. Although D&D equipment would be visible from I-5, all ~~Phase 1~~ activities would occur within the SONGS site boundaries. Temporary D&D activities would not increase the visual effects of SONGS from surrounding critical public viewpoints. As identified in Table 4.2-2, the SONGS facility is currently a "Distracting, Visually Dominant" use within the landscape. The temporary use of equipment ~~associated with Phase 1~~ would not adversely affect the coastal viewshed.

The Proposed Project would create a long-term beneficial impact to the coastal viewshed by removing most of a prominent coastal energy facility's above-ground structures, systems, and components (SSCs) that block views of the Pacific Ocean, helping return the area to a more natural state consistent with the surrounding coastal landscape. In addition, backfilling and grading activities would restore the area to obtain a level grade. These activities are consistent with San Diego County policies and goals for natural scenic resources and maintaining aesthetic features of the surrounding scenic landscape.

Mitigation Measures

No MMs are recommended for Impact AES-1.

Impact AES-2: Damage Scenic Resources.

Decontamination and decommissioning activities could damage scenic resources, including the viewshed within a scenic highway **(Less than Significant).**

Impact Discussion

The Proposed Project would be visible from I-5, which is a County Designated Scenic Highway, as well as from the Old Pacific Highway and the Pacific Coast Bike Route. While D&D activities would require use of heavy equipment and would include modifications or improvements to access roads within the Proposed Project site, work activities would occur in disturbed areas (see Section 2.3.1, *Onshore Site Preparation*) and no degradation or damage to scenic resources within the AVE, such as trees, outcroppings, or historic buildings, is anticipated. Offshore dispositioning activities that require dredging equipment, barges, and tug boats would also be visible from I-5, but such activities would be temporary and would not permanently impact a scenic resource. Following the completion of the Proposed Project, which would permanently remove prominent onshore structures, the coastal viewshed would be notably improved from existing conditions.

Mitigation Measures

No MMs are recommended for Impact AES-2.

Impact AES-3: Degrade Visual Character or Quality of Site and its Surroundings.

The Proposed Project contributes to a perceptible improvement in visual quality within the AVE **(Beneficial).**

Impact Discussion

The Proposed Project would improve the visual quality of the environment within the AVE. Structures to be removed include larger facility components such as Units 2 and 3 reactor vessels, steam generators, pressurizers, turbine-generators, and the Unit 1 reactor vessel. A considerable portion of paving from onshore areas would also be removed. Proposed Project activities would increase the total unpaved area from 12 acres to approximately 65 acres (Southern California Edison [SCE] 2016a – Data Request [DR] #1-25). The effect of the Proposed Project activities would improve the VMCs for each of the four Critical Public Views (listed in Section 4.2.1.3, *Determining the Area of Visual Effect*) in the following manner:

- **San Onofre Bluffs.** Removal of the dominant visual onshore structures of SONGS would improve the visual quality of this public view. The greatest improvements would result from dismantling activities. As SONGS is currently co-dominant with the surrounding landscape (VMC-3), removal of the facility would improve this public view to VMC-4.

- **San Onofre Surf Beach.** While the site is currently VMC-3 due to the co-dominant presence of SONGS, Proposed Project activities would improve the visual quality to VMC-4. These activities would allow the Surf Beach to become a visually unimpaired, dominant feature in the surrounding landscape.
- **Pacific Coast Bike Route.** Currently, the public view from the bike route is impaired by the existing SONGS facility, which is a visually dominant use within the bike route's AVE. The Proposed Project would remove components of SONGS and restore the natural character of the site. Implementation of the Proposed Project would allow the Pacific Coast Bike Route to retain its VMC-4 status, but would substantially improve the visual quality of this public view by establishing the coastal landscape as the visually unimpaired, dominant feature.
- **Public Beach Access Walkway.** Currently, the walkway's public view is restricted by the existing SONGS ~~facility~~seawall, which is a visually dominant ~~use~~ feature within the walkway's AVE. Removing the SONGS onshore faciltities as part of the Proposed Project would ~~improve the existing visual quality of this public view~~have no impact on public views from the walkway because the seawall is not planned for removal as part of the Proposed Project and would continue to dominate the walkway views. The proposed D&D activities therefore would allow the walkway to retain its VMC-4 status.~~, while substantially improving its visual quality by establishing the coastal landscape as the visually unimpaired, dominant feature.~~

The Proposed Project would maintain or improve the VMCs for the public views within the AVE, thereby creating a beneficial impact to the AVE's visual quality.

Mitigation Measures

No MMs are recommended for Impact AES-3.

Impact AES-4: Create Light and Glare.

The Proposed Project activities could create minor temporary new sources of light or glare **(Less than Significant).**

Impact Discussion

The Proposed Project would not create significant light or glare, as temporary nighttime lighting that may be required would not substantially increase existing illumination at the site. Existing conditions in the Proposed Project's AVE include nighttime lighting that is part of the SONGS facility's security plan in accordance with NRC regulations, general area lighting in accordance with Occupational Health and Safety Administration (OSHA) requirements, egress lighting in accordance with National Fire Protection Association (NFPA) requirements, and Federal Aviation Administration (FAA)-required beacons.

Construction activities would primarily occur during daytime hours (i.e., between 6 a.m. to 6 p.m.) (SCE 2016a – DR #1-22, 1-46). However, weekend and nighttime work may be needed to avoid interruption to critical work activities or to meet key milestones; in these instances, portable lighting would be used in work areas. For example, during D&D activities, temporary lighting may be used around excavations, scaffolding, and other construction equipment.

There are few receptors in the AVE that would be affected by nighttime lighting. The nearest campground is approximately 0.5 mile east of the Proposed Project site at San Onofre Bluffs, and the nearest residences are approximately 0.75 mile from the western boundary of the site. If an increase in nighttime illumination from existing conditions were to occur during the Proposed Project, less-than-significant light or glare impacts would occur given the distance of sensitive receptors from the site.

Mitigation Measures

No MMs are recommended for Impact AES-4.

4.2.5 Cumulative Impacts

As discussed in Section 3.2, *Relevant Cumulative Projects*, and shown in Table 3-2, 15 reasonably foreseeable cumulative projects fall within the geographic area near SONGS considered for potential cumulative impacts related to aesthetics.

As discussed in Section 4.2.4, *Environmental Impact Analysis and Mitigation*, the Proposed Project itself would increase the visual quality of the AVE, thereby resulting in a beneficial impact to aesthetics. The Proposed Project may increase nighttime illumination above existing conditions, and this increase may combine cumulatively with additional nighttime lighting required for ~~expansion~~ the new Holtec facility portion of the Approved ISFSI discussed in Section 3.2.1, *SONGS Independent Spent Fuel Storage Installation ~~Expansion~~* (see also Cumulative Projects ID No. 1 in Table 3-2). Given that the Approved ISFSI ~~expansion~~ is subject to the same nighttime lighting regulations and requirements as the Proposed Project, and given the distance of nearby sensitive receptors from SONGS and intervening topography (see discussion for Impact AES-4), the combined impact from nighttime lighting would not be cumulatively considerable. None of the other projects listed in Table 3-2 are anticipated to have nighttime lighting requirements that could combine with the illumination effects of the Proposed Project to contribute to a cumulative impact. The Proposed Project would not have a significant adverse cumulative effect on aesthetics.

4.2.6 Future Activities

SONGS Decommissioning would involve activities that are consistent with San Diego County's scenic resource preservation policies. Future Activities may involve the removal

of additional onshore above-grade structures, such as Parking Lots 1, 2, 3, and 4 and an additional 22 acres of paving, which would increase the total amount of unpaved area from 65 acres to 87 acres. The relocation of the Approved ISFSI, if determined by the California Coastal Commission, and potential conflicts with aesthetic resource policies, goals, plans, laws, and regulations would need to be assessed at that time.

Future Activities would also include additional offshore activities such as removing the solid covers on the mammal exclusion barriers of the Unit 2 discharge conduit and, if required by the Commission, removal of remaining discharge conduit diffuser ports, which would involve the use of marine vessels. These activities would result in minor, temporary aesthetic impacts. In addition, they would not violate any regional public policies or directives pertaining to natural scenic resources, but rather would align with San Diego County's goals for maintaining the aesthetic features of the surrounding scenic landscape, thereby resulting in a beneficial impact.

Future Activities would improve the AVEs visual quality with the removal of exposed riprap above the beach surface within the Department of the Navy (DoN) easement. Future Activities may also include removal of the seawall and the public beach access walkway. As these activities are contingent on future DoN requirements and jurisdictional agency permit conditions, the final disposition of these components is currently unknown.

While most Future Activities would be visible from I-5, which is identified as a County Designated Scenic Highway, none of the known activities would damage or otherwise degrade scenic resources and no activities would affect trees, outcroppings, historic buildings, or other scenic resources along I-5.

Nighttime lighting along the Approved ISFSI security boundary would continue throughout Future Activities when the Approved ISFSI would be removed (i.e., the life of the Approved ISFSI [SCE 2016a – DR #1-74]). All lighting would comply with NRC regulations and FAA, OSHA, and NFPA requirements. Given the distance of sensitive receptors from the site, light and glare impacts would not be significant. By the end of decommissioning most existing lighting would be removed, except in the switchyard area, which would not be decommissioned.

4.2.7 Summary of Proposed Mitigation Measures

Table 4.2-3 provides a summary of the mitigation and Applicant-proposed measures.

Table 4.2-3. Aesthetic Impact/Mitigation Summary

Impact	MM/APM
AES-1: Affect a Scenic Vista	None recommended
AES-2: Damage Scenic Resources	None recommended
AES-3: Degrade Visual Character or Quality of Site and its Surroundings	None recommended
AES-4: Create Light and Glare	None recommended

4.3 AIR QUALITY

This section describes the air quality within the air basins that would be affected by the Proposed Project, identifies applicable air district significance thresholds, assesses the Proposed Project's impacts to air quality and their significance, and recommends measures to avoid or substantially reduce any effects found to be potentially significant. The environmental setting is based on information obtained from the Proposed Project description, an engineering study of the San Onofre Nuclear Generating Station (SONGS) Units 2 and 3 offshore intake and discharge conduit alternatives (COWI Marine North America [COWI] 2017), and applicable agency reports. Greenhouse gases (GHGs) are addressed in Section 4.8, *Greenhouse Gas Emissions*.

4.3.1 Environmental Setting

4.3.1.1 Regional Climate and Meteorology

The Proposed Project is located along the Pacific Ocean within and offshore Marine Corps Base Camp Pendleton (MCBCP) in northern San Diego County. This area is characterized by a semi-arid Mediterranean-type climate and relatively mild sea breezes. Average temperatures and precipitation at a National Oceanic and Atmospheric Administration (NOAA) meteorological station at MCBCP are provided in Table 4.3-1.

Table 4.3-1. Monthly Climatic Summary at MCBCP

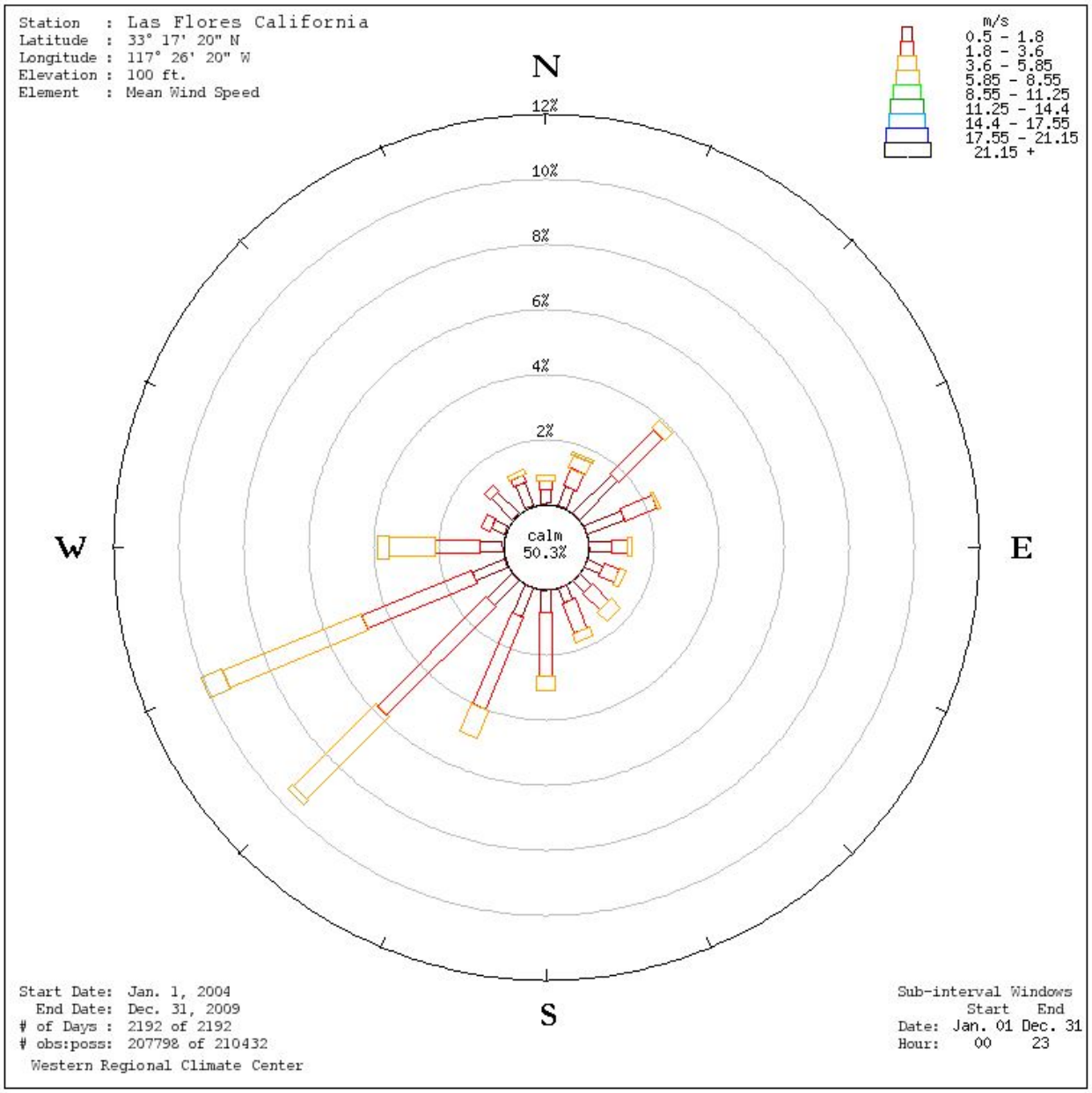
Month	Average Maximum Temperature (°F)	Average Minimum Temperature (°F)	Average Total Precipitation (Inches)
January	68	41	2.1
February	68	43	3.1
March	69	46	2.3
April	73	49	0.7
May	73	54	0.2
June	76	57	0.2
July	80	61	0.1
August	82	62	Trace
September	82	59	0.1
October	78	54	0.5
November	75	45	0.8
December	69	40	1.8
Annual Average	**74**	**51**	**-**
Annual Total	**-**	**-**	**11.8**

Source: NOAA 2016a.
Acronyms: °F = degrees Fahrenheit.
Notes: Data period 1966 – 1993 at NOAA Station 0722926.

Typical wind speeds and directions for the Proposed Project area, as depicted in the wind rose in Figure 4.3-1, show a predominant onshore wind flow from the southwest, a weak offshore flow from the northeast, and a very large number of calm wind hours. The

predominant winds within the coastal region blow in an east-northeasterly direction during October through February, and in a west-northwesterly direction during March through September. During Santa Ana conditions, winds from the northeast are unusually strong.

Figure 4.3-1. Las Flores California Station Wind Rose (2004 – 2009)



Source: Western Regional Climate Center 2016.
Note: The wind rose is derived from the nearby Los Flores Western Regional Climate Center meteorological station located on MCBCP a few miles southeast of the Proposed Project site.

Regional climate is also affected by El Niño Southern Oscillation (El Niño) events and the Pacific Decadal Oscillation. El Niño is a global-scale climatic variation that occurs approximately every 2 to 7 years. The atmospheric disturbance associated with severe storms during the winters of 1982/83 and 1997/98, which were the result of intense El Niño events, caused abnormally warm water temperatures and a reversal of the westerly trade winds (Flick 1998). The Pacific Decadal Oscillation, a cyclic pattern of ocean-atmosphere climate variability centered over the Northern Pacific Ocean, can also cause changes to sea surface temperatures, air temperature, and precipitation patterns.

4.3.1.2 Affected Air Quality Jurisdictions

The Proposed Project area where decontamination and dismantlement (D&D) activities would occur is within the San Diego Air Basin. The Proposed Project would also affect other air basins as a substantial amount of waste materials would be transported from SONGS by truck or rail, and marine vessels would transit to and from the Proposed Project's ~~o~~Offshore ~~s~~Site. (For this analysis, this EIR assumes that decommissioning wastes transported from SONGS, and the conduit wastes removed offshore and received at and transported from the Port of Long Beach/Port of Los Angeles [POLB/POLA], would be hauled out of state.) The local air quality jurisdictions affected are:

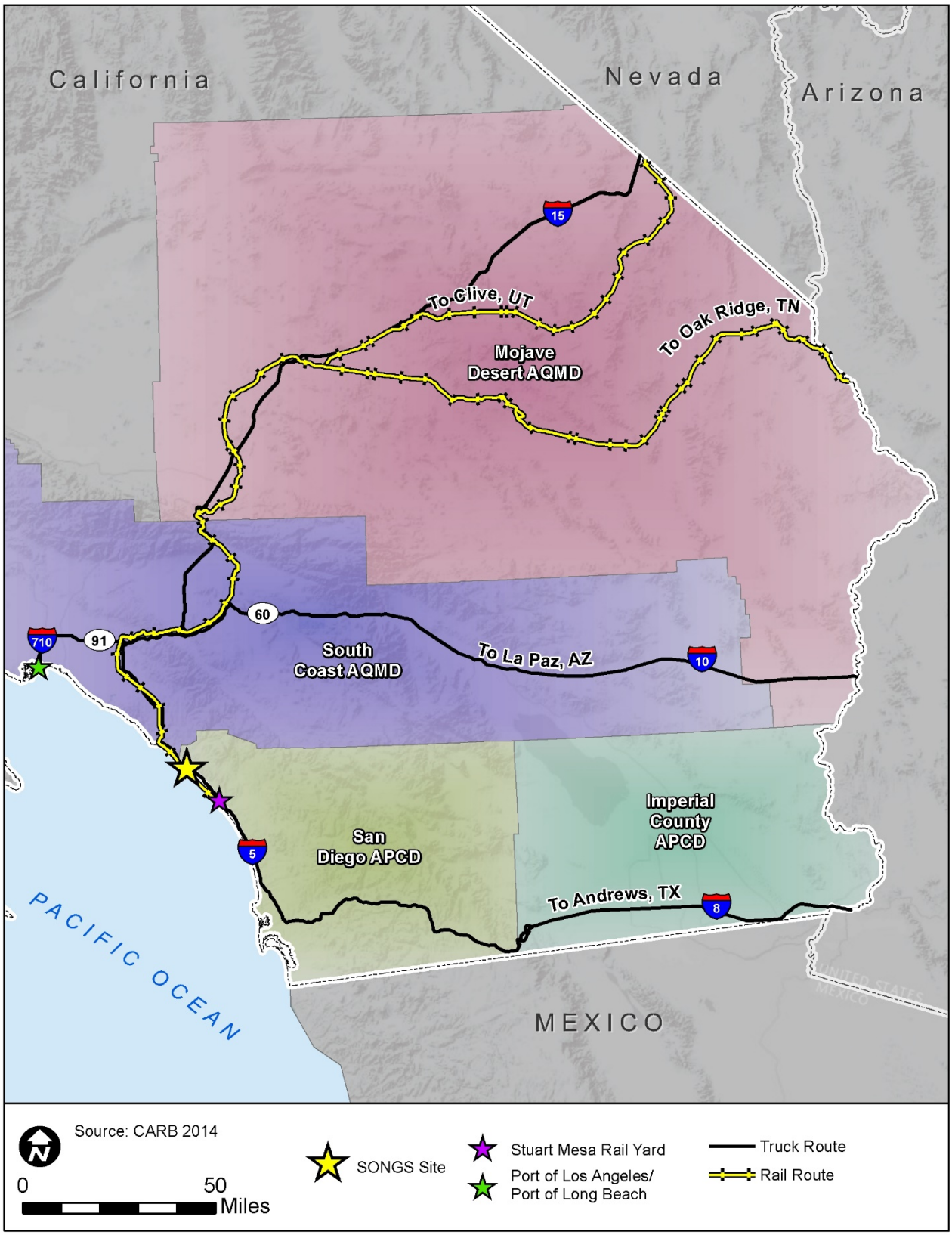
- San Diego Air Pollution Control District (SDAPCD)
- South Coast Air Quality Management District (SCAQMD)
- Mojave Desert Air Quality Management District (MDAQMD)
- Imperial County Air Pollution Control District (ICAPCD)

The affected air quality jurisdiction boundaries, the SONGS site, and the anticipated truck and rail decommissioning waste haul routes are depicted in Figure 4.3-2. The primary offshore work vessel traffic route from the POLB/POLA in the coastal waters jurisdiction of the SCAQMD and SDAPCD is depicted in Figure 3-1 (see Section 3.0, *Cumulative Projects*). In addition to the vessel route shown in Figure 3-1, crew boats would transit within the coastal waters jurisdiction of SCAQMD and SDAPCD from Dana Point Harbor to the conduit removal areas.

4.3.1.3 Air Pollutants and Monitoring Data

Air pollutants are defined as two general types: (1) "criteria" pollutants, representing pollutants for which national and state health- and welfare-based ambient air quality standards (AAQS) have been established; and (2) toxic air contaminants (TACs), which may lead to serious illness or increased mortality even when present at relatively low concentrations. An additional air quality related issue of concern is Valley Fever, which is a disease caused from soil-bound fungal spores becoming airborne as part of the fugitive dust emissions caused by excavation and other ground-disturbing activities.

Figure 4.3-2. Proposed In-StateTransportation Routes and Air Jurisdictions



Criteria Pollutants

The U.S. Environmental Protection Agency (USEPA), California Air Resources Board (CARB), and air districts classify an area as attainment (compliance), unclassified (insufficient data available), or nonattainment (non-compliance) depending on the status of monitored ambient air quality data with the AAQS. Table 4.3-2 provides the California and National AAQS and summarizes air quality from 2014~~3~~ through 2016~~5~~ collected at the nearest representative monitoring stations. The ambient air quality data indicate that between 2014~~3~~ and 2016~~5~~, the area experienced exceedances of the state and federal ozone standards. Table 4.3-3 shows the 2018 attainment status of criteria pollutants for the San Diego Air Basin based on the National and California AAQS.

Table 4.3-2. Ambient Air Quality Standards and Background Data

Pollutant	Averaging Time	Standards and Maximum Concentrations (ppm or µg/m^3) [1]					Health Effects
		CAAQS	NAAQS	2014	2015	2016	
Ozone (O_3) [2]	1-hour	0.090	--	0.097	0.093	0.083	Breathing difficulty, lung tissue damage
	8-hour	0.070	0.070	0.079	0.076	0.073	
Respirable PM (PM_{10}) [3]	24-hour	50.0	150.0	41.0	49.0	59.0	Increased respiratory disease, lung damage, cancer, premature death
	Annual	20.0	--	20.2	18.0	21.0	
Fine PM ($PM_{2.5}$) [3]	24-hour [5]	--	35	--	15.1	13.4	
	Annual [6]	12	12	--	7.0	7.3	
Carbon monoxide (CO) [3]	1-hour	20	35	1.2	1.4	1.3	Chest pain in heart patients, head-aches, reduced mental alertness
	8-hour	9	9	0.8	0.7	0.7	
Nitrogen di-oxide (NO_2) [2]	1-hour [7]	0.18	0.10	0.051	0.044	0.047	Lung irritation and damage
	Annual	0.030	0.053	0.007	0.007	0.006	
Sulfur dioxide (SO_2) [4]	1-hour [7]	0.25	0.075	0.001	0.001	0.001	Increased lung disease, breathing problems for asthmatics
	3-hour	--	0.5	--	--	--	
	24-hour	0.04	--	0.0005	0.0004	0.0005	

Sources: CARB 2009~~1~~; CARB 2016; CARB 2018a; USEPA 2018a.
Acronyms/Notes: CAAQS/NAAQS = California/National Ambient Air Quality Standards; PM = particulate matter; $PM_{2.5}$ = PM that is less than 2.5 micrometers (µm) in diameter; PM_{10} = PM that is 10 µm or less in diameter; ppm = parts per million; µg/m^3 = micrograms per cubic meter; "--" = no standard or no data or insufficient annual coverage currently available.
[1] Gaseous pollutant (O_3, CO, NO_2, SO_2) standards and concentrations are in ppm; PM standards and concentrations are in µg/m^3.
[2] Data from MCBCP monitoring station: O_3, NO_2.
[3] Data from Mission Viejo monitoring station: CO, SO_2, PM_{10}, $PM_{2.5}$. CO monitoring data from USEPA.
[4] Data from El Cajon monitoring station: SO_2. Monitoring data from USEPA.
[5] The federal 24-hour $PM_{2.5}$ standard is based on the 98th percentile of maximum daily monitored values.
[6] The federal standard shown is the primary standard, the secondary standard is 15 µg/m^3.
[7] The new federal 1-hour NO_2 and SO_2 standards are based on the 98th and 99th percentile of daily hourly maximum values, respectively.

Table 4.3-3. Attainment Status for the San Diego Air Basin (2018)

Pollutant	Attainment Status	
	Federal	State
Ozone (O_3)	Nonattainment	Nonattainment
Respirable PM (PM_{10})	Attainment	Nonattainment
Fine PM ($PM_{2.5}$)	Attainment	Nonattainment
Carbon monoxide (CO)	Attainment	Attainment
Nitrogen dioxide (NO_2)	Attainment	Attainment
Sulfur dioxide (SO_2)	Attainment	Attainment

Sources: CARB 2018b; USEPA 2018b.

Table 4.3-2 describes some general health impacts caused by the regulated criteria pollutants. Overall exposure to criteria air pollutant levels and levels of toxic air contaminants contribute to the health burden of the regional population. While the NAAQS and CAAQS are health-protective standards set to minimize both human health effects and other environmental effects of air pollutants, these standards do not preclude individuals from experiencing health impacts from criteria pollutant exposure. The health impacts also contribute to the region's baseline rates of mortality and illnesses, and individual responses are highly variable depending on individual circumstances. Currently, while the California State Office of Environmental Health Hazard Assessment provides guidance and modeling software that can be used to assess the project-level health impacts of toxic air contaminants, there is no comparable agency guidance on assessing project-level dose-response health effect consequences for criteria pollutants. Mortality and illnesses like asthma, and data on hospital admissions and emergency room visits, can be correlated with the localized concentrations of ozone, $PM_{2.5}$ and other criteria pollutants, although the correlations are not numerically standardized. For example, higher pollutant concentrations of SO_2 or $PM_{2.5}$ will correlate with an increase in asthma attacks and mortality, and increases in other pollutant concentrations will correlate with increases in the occurrence of the health effects known to be caused by those pollutants (see Table 4.3-2).

Toxic Air Contaminants

Toxic air contaminants (TACs) are compounds that are known or suspected to cause adverse long-term (cancer and chronic) or short-term (acute) health effects. The Health and Safety Code defines a TAC as an air pollutant which may cause or contribute to an increase in mortality or serious illness, or which may pose a present or potential hazard to human health. Individual TACs vary greatly in the health risk they present; at a given level of exposure, one TAC may pose a hazard that is many times greater than another's. There are almost 200 compounds designated in California regulations as TACs (Cal. Code. Regs., tit. 17, §§ 93000-93001). The list of TACs includes substances defined in federal statute as hazardous air pollutants pursuant to Section 112(b) of the federal Clean Air Act (42 U.S.C. § 7412(b)). Some of the TACs are groups of compounds which contain many individual substances (e.g., copper compounds, polycyclic aromatic compounds,

radionuclides). TACs are emitted from mobile sources, including diesel engines; industrial processes and stationary sources, such as dry cleaners, gasoline stations, paint and solvent operations, and stationary fossil fuel-burning combustion. Ambient TACs concentrations tend to be highest in urbanized and industrial areas near major TACs emissions sources or near major mobile TACs emissions sources, such as heavily traveled highways or major airports/seaports. Unlike for criteria pollutants, regular monitoring and reporting of all ambient TACs concentrations, such as diesel particulate matter concentrations, is not performed in San Diego County. Generally, TACs do not have AAQS. The three TACs that do have California AAQS (lead, vinyl chloride, and hydrogen sulfide) are pollutants that are in attainment of the state standards in San Diego County and are not relevant to the air pollutant emissions sources for this Proposed Project.

Valley Fever

Coccidioidomycosis, often referred to as San Joaquin Valley Fever or Valley Fever, is one of the most studied and oldest known fungal infections. Valley Fever varies with the season and most commonly affects people who live in hot dry areas with alkaline soil. This disease affects both humans and animals, and is caused by inhalation of arthroconidia (spores) of the fungus *Coccidioides immitis* (CI). CI spores are found in the top few inches of soil, and the existence of the fungus in most soil areas is temporary. The cocci fungus lives as a saprophyte (an organism, especially a fungus or bacterium, which grows on and derives its nourishment from dead or decaying organic matter) in dry, alkaline soil. When weather and moisture conditions are favorable, the fungus "blooms" and forms many tiny spores that lie dormant in the soil until they are stirred up by wind, vehicles, excavation, or other ground-disturbing activities and become airborne. Agricultural workers, construction workers, and other people who are outdoors and are exposed to wind, dust, and disturbed topsoil are at an elevated risk of contracting Valley Fever (California Department of Public Health [CDPH] 2013).

Most people exposed to the CI spores will not develop the disease. Of 100 persons who are infected, approximately 40 will exhibit some symptoms and 2 to 4 will have the more serious disseminated forms of the disease. After recovery, nearly all, including the asymptomatic, develop a life-long immunity to the disease (Guevara 2014). African-Americans, Asians, women in the third trimester of pregnancy, and persons whose immunity is compromised are most likely to develop the most severe form of the disease (U.S. Center for Disease Control and Prevention [CDC] 2013). In addition to humans, a total of 70 different animal species are known to be susceptible to Valley Fever infections, including dogs, cats, and horses (Los Angeles County Public Health 2007).

The Proposed Project is in an area designated as suspected endemic for Valley Fever by the Center for Disease Control (CDC 2013). Annual case reports for 2000 through 2013 from the CDPH indicate that San Diego County has reported incident rates for Valley

Fever that range from 1.8 to 4.8 cases per year per 100,000 population (CDPH 2011; CDPH 2016). These incidence rates for San Diego County have been below the State average incidence rates and have been well below the worst-case annual rates for other counties within the State during this period, which occurred within the San Joaquin Valley, where there have been over 300 cases per 100,000 population in some calendar years.

4.3.1.4 Sensitive Receptors

The impact of air pollutant emissions on sensitive members of the general population (e.g., infants, children, pregnant women, elderly, and acutely and chronically ill) is a special concern. Per County of San Diego California Environmental Quality Act (CEQA) guidance (County of San Diego 2007a), sensitive receptor locations include schools, daycare centers, retirement homes, hospitals, and residences.

Recreational land uses are considered moderately sensitive to air pollution. Although exposure periods are generally short, exercise places a high demand on respiratory functions, which can be impaired by air pollution. In addition, noticeable air pollution can detract from the enjoyment of recreation. Residential areas can also be sensitive to air pollution due to high exposure periods for individuals that do not leave their residences often. Industrial and commercial areas are considered the least sensitive to air pollution. Exposure periods are relatively short and intermittent, as most workers stay indoors. In addition, the working population is generally the healthiest segment of the public.

The ~~Proposed Project area~~SONGS site is generally surrounded by open space, with MCBCP and state parks surrounding much of the site and the Pacific Ocean being southwest of the site. There are no residences or other occupied properties located within a 0.5 mile of the site. The closest residences and school are located on MCBCP approximately 0.75 mile and just over 1 mile from the site, respectively. Recreational uses, including beaches and bicycle paths, are located near the site (Google Earth 2017). The offsite truck and rail waste haul routes are in closer proximity to sensitive receptors, such as schools and residences, in the more densely populated areas along the long transportation routes to the Utah, Nevada, Tennessee, and/or Texas waste disposal sites.

4.3.2 Regulatory Setting

Sources of air pollutant emissions in the San Diego Air Basin are regulated by the USEPA, CARB, and SDAPCD. The County of San Diego has adopted air quality policies in its General Plan, and has published CEQA Guidelines and significance criteria for air quality impact analysis. Relevant federal and state laws, regulations, and policies that pertain to air quality are summarized in Appendix A. Local laws, regulations, and policies related to air quality are discussed below. The other affected local air quality jurisdiction regulations are not summarized as these jurisdictions are primarily affected by mobile source transportation emissions, which are not regulated at the local level.

4.3.2.1 San Diego Air Pollution Control District

The SDAPCD is responsible for planning, implementing, and enforcing federal and state ambient standards in San Diego County and for permitting and controlling stationary sources and TAC pollutants. As part of its planning responsibilities, SDAPCD prepares Air Quality Management Plans and Attainment Plans as needed based on the attainment status of the air basins within its jurisdiction. The SDAPCD has developed the following federal and state attainment planning documents (SDAPCD 2017; the USEPA has not yet approved the most recently SDAPCD-approved plans).

Federal Plans	• 2008 8-Hour Ozone Attainment Plan for San Diego County (December 2016) • 2008 8-Hour Ozone Reasonably Available Control Technology Demonstration for San Diego County (December 2016) • Redesignation Request and Maintenance Plan for the 1997 8-Hour National Ozone Standard for San Diego County (December 2012) • Eight-Hour Ozone Attainment Plan for San Diego County (May 2007) • Ozone Redesignation Request and Maintenance Plan for San Diego County (Federal 1-Hour Ozone Maintenance Plan) (December 2002)
State Plans	• 2016 Revision of the Regional Air Quality Strategy for San Diego County (December 2016) • 2009 Regional Air Quality Strategy Revision (April 2009) • Measures to Reduce Particulate Matter in San Diego County (December 2005)

Through the attainment planning process, the SDAPCD develops the SDAPCD's Rules and Regulations to regulate sources of air pollution in San Diego County (SDAPCD 2016). The SDAPCD rules that may be applicable to the Proposed Project are identified below.

SDAPCD Rule 50 – Visible Emissions	This rule prohibits discharge of air contaminants or other material that are as dark or darker in shade as that designated No. 1 on the Ringelmann Chart or that obscure an observer's view.
SDAPCD Rule 51 – Nuisance	This rule prohibits discharge of air contaminants or other material that cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public; or that endanger the comfort, repose, health, or safety of any such persons or the public; or that cause, or have a natural tendency to cause, injury or damage to business or property.
SDAPCD Rule 55 – Fugitive Dust Control	The purpose of this rule is to control the amount of PM entrained in the atmosphere from human-made sources of fugitive dust. The rule limits visible dust opacity and visible dust plumes beyond property lines, and requires control of track-out onto paved roads.
SDAPCD Regulation II – Permits	The rules under this regulation require the permitting of stationary sources, require new emission sources use best available control technology to control criteria pollutant emissions, and require offsetting of emissions if permitted emissions would exceed designated thresholds. Stationary sources that may be required during site demolition activities would include a concrete batch plant and a concrete crusher. There is also the potential that portable internal combustion engines being used during Proposed Project construction would require permits from SDAPCD, if they are not permitted under the CARB Portable Equipment Registration Program.

4.3.2.2 County of San Diego

The County of San Diego has adopted a General Plan that includes air quality related goals and policies (County of San Diego 2011). There are several air quality goals noted in the general plan, including the use of sustainable technology and products, and encouraging contractors to use low-emission construction vehicles and equipment.

The County of San Diego also has developed CEQA guidance documents that provide report format and content requirements and significance thresholds for air quality analysis (County of San Diego 2007a, b). These documents have been used to establish the significance criteria to evaluate the Proposed Project impacts (see Section 4.2.3, *Significance Criteria*, above).

4.3.3 Significance Criteria

The significance criteria used to evaluate the Project impacts to air quality are based on State CEQA Guidelines Appendix G. According to State CEQA Guidelines Appendix G, a significant impact related to air quality would occur if the Project would:

- Conflict with or obstruct the implementation of the applicable portions of the State Implementation Plans (SIP) for the local jurisdictions affected by the Proposed Project's emissions.
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation.
- Result in a cumulatively considerable net increase of any criteria pollutant for which affected air basins are in non-attainment under applicable federal or state AAQSs.
- Expose sensitive receptors to substantial pollutant concentrations.
- Generate objectionable odors affecting a considerable number of people.

San Diego County Thresholds have been used to evaluate the Proposed Project's on-site emissions and those transportation emissions occurring within San Diego County. For Proposed Project transportation emissions outside San Diego County, the most stringent thresholds available from the other local jurisdictions directly affected are used to determine significance within each of these other local jurisdictions.

4.3.4 Environmental Impact Analysis and Mitigation

This section addresses the air quality impacts of the Proposed Project, including criteria pollutant and TAC emissions impacts (see Section 4.1, *Hazardous and Radiological Materials*, for a discussion of impacts related to potential radionuclide exposure). The emissions estimate and impact analysis for the Proposed Project are limited to the known activities to be conducted as detailed in Section 2.3, *Proposed Project Activities*, with additional details provided in the SONGS Decommissioning Project (Units 2 and 3

Offshore Conduits) Engineering Study of Conduit Disposition Alternatives (COWI 2017), as follows:

- **Decontamination and Dismantlement.** The demolition activity requirements for the Proposed Project are known. Worst-case emissions are estimated on best available information as to the work required. Onshore work activity does not include additional subsurface removal work that may be required by the DoN, as it has not yet been defined, nor does it include SNF packaging and shipment, which is part of Future Activities under the exclusive oversight of the NRC.
- ~~**Offshore Conduit Disposition**~~ **CSLC Lease Offshore Activities.** The offshore work activity is generally well defined and overlaps D&D activities to create a combined worst-case emissions period. The impact evaluation presented below is based the Applicant-proposed partial removal of the offshore vertical riser structures. Potential impacts for full removal of the offshore conduits are analyzed as an alternative (Section 5.4.2, *Full Removal of Offshore Conduits*).

The emissions estimate uses regulatory agency-based emissions factor sources and emissions calculation methods. The emissions factor sources used include:

- EMFAC2014 – CARB's current on-road vehicle emissions model
- CalEEMod version 2016.3.1 – Indirectly provides emissions factors from OFFROAD, CARB's current off-road equipment emissions model
- USEPA Compilation of Air Emissions Factors (AP-42) – Provides methods for fugitive dust emissions factor determinations for various construction/ demolition and mobile source dust emissions sources, including paved road dust, and demolition dust emissions
- 2015 POLB Air Emissions Inventory – Marine vessel emissions sources
- USEPA 2009 Emissions Factors for Locomotives document (EPA-420-F-09-025) – Rail hauling emissions

No specific emissions reductions measures were assumed for any of the tailpipe emissions sources (e.g., vehicles, locomotives, marine vessels, off-road equipment). Either fleet-wide average emissions factors were assumed for emissions year (on-road vehicles, off-road equipment, and line-haul locomotives), or the most current source average emissions factors for emissions sources without future year forecasting (marine vessels) were assumed. The peak emissions year evaluated is 2023, which assumes that most of the on-road vehicles and a sizable fraction of the off-road equipment meet the latest state and federal on-road and off-road engine emissions standards.

Fugitive dust emissions reduction measures were not specifically identified and many of the fugitive dust emissions source calculations are unmitigated; however, the use of

certain emissions factor inputs, such as moisture content, for some of the fugitive dust emissions sources assume that wet dust suppression would occur.

ENVIRONMENTAL IMPACT ANALYSIS

This analysis assesses the potential impacts to air quality due to the Proposed Project's criteria pollutant and TACs emissions. Table 4.3-6 at the end of this section provides a list of the Proposed Project's potential impacts related to air quality, and the mitigation measures (MMs) and Applicant-proposed measures (APMs) recommended to reduce the Proposed Project's significant NO_X emissions to the maximum extent feasible. However, even with mitigation, the Proposed Project would continue to exceed the NO_X emission thresholds resulting in a significant and unavoidable air quality impact.

Impact AQ-1: Conflict or Obstruct Implementation of Applicable Air Quality Plans.

The Proposed Project could conflict with or obstruct implementation of the SDAPCD air quality plans or County of San Diego General Plan **(Less than Significant).**

Impact Discussion

The Proposed Project would be completed in compliance with applicable current federal, state, and SPAPCD air quality rules and regulations developed to implement applicable air quality plans, as well as any applicable regulations promulgated during implementation of the Proposed Project (2019-2025). The currently applicable SDAPCD air quality plans do not call for any additional future emission reduction regulations that would affect the Proposed Project's emissions sources, which are primarily off-road equipment, on-road vehicle, rail locomotive, and marine vessel emissions sources that are not regulated by SDAPCD. Additionally, the Proposed Project would not cause or induce growth beyond the assumptions within the applicable air quality plans or otherwise obstruct implementation of the applicable air quality plans, as it would not involve the construction of any new facilities that would result in the removal of an impediment to growth, establish any new public services, or provide access to previously inaccessible areas.

The Proposed Project also would not conflict with any County of San Diego General Plan air quality goals or policies. The General Plan does not have a separate air quality element and the air quality policies included in the Conservation and Open Space Element are general in nature, and with one exception, do not directly apply to the Proposed Project's emissions sources. The exception is Policy COS-14.0 *Low-Emissions Construction Vehicles and* Equipment, which only "encourages other developers to use low-emission construction vehicles and equipment, so conformance with this policy has no specific mandates. Therefore, impacts would be less than significant.

Mitigation Measures

No MMs are recommended for Impact AQ-1.

Impact AQ-2: Violation of Ambient Air Quality Standards.

The Proposed Project could result in criteria pollutant emissions that cause or substantially contribute to a violation of an Ambient Air Quality Standard (AAQS) **(Less than Significant).**

Impact Discussion

Proposed Project air pollutant emissions would occur for 7 years. Even at its known emissions peaks during the Proposed Project's activities (see regional emissions analysis under Impact AQ-3), emissions would not be of sufficient magnitude to cause or substantially contribute to a violation of the current AAQS. Most of the Proposed Project's emissions are transportation related (on-road vehicles, rail locomotives, and marine vessels) that would occur over a very large area. The emissions at the Proposed Project site would not be of a magnitude to substantially ~~e~~affect the air pollutant concentrations that are measured at the ambient air quality monitoring stations located in San Diego County or nearby Orange County.

Health effects from the Proposed Project's criteria pollutant emissions are similarly expected to be of a magnitude below significance given the distance and direction of sensitive receptors from SONGS. It is not feasible to model the precise nature and magnitude of the Proposed Project's emissions-caused ambient air quality concentration impacts, or the health effects related to these emissions, because they are emitted and then dispersed over very large areas within several air basins, and because there is no standardized dose-response guidance for low-level increases. However, the AAQS are set at levels that are meant to be health protective, and the Proposed Project would not have emissions of a magnitude that could directly cause substantial increases in ambient pollutant levels at any receptor location surrounding the Proposed Project site, locally or regionally.

The Proposed Project would not have the potential to substantially affect secondary pollutant formation[34] or ambient concentrations that could cause significant health effects. These secondary pollutants do not occur near the Proposed Project site, but are regional in nature, requiring extremely complex regional modeling. Given the Proposed Project's emissions in comparison with the regional emissions of secondary pollutant precursors (NO_X, VOC, and SO_X), such complex regional modeling would show that the Proposed Project would have a very minimal contribution to secondary pollutant formation in the regions it has the potential to affect. Therefore, the Proposed Project's effect on ozone

[34] Secondary pollutants are not those emitted at the site, but rather are created by complex reactions over time, like ozone, and secondary PM_{10} and $PM_{2.5}$

and other secondary pollutants would be negligible. (See Impacts AQ-3 and AQ-4 for additional discussion on sensitive receptors and ambient air quality health impacts).

In summary, the Proposed Project's emissions would not be of a magnitude to cause or substantially contribute to a violation of an ambient air quality standard, nor would the Proposed Project's emissions have the potential to create increases in ambient air quality concentrations that could cause substantial health effects. Therefore, impacts would be less than significant.

Mitigation Measures

No MMs are recommended for Impact AQ-2.

Impact AQ-3: Result in a Cumulatively Considerable Net Increase of Any Criteria Air Pollutant for which the Project Region is in Nonattainment.

The Proposed Project could create NO_X pollutant emissions within the SCAQMD and MDAQMD jurisdictions that exceed thresholds **(Significant and Unavoidable).**

Impact Discussion

The Applicant provided an initial estimate for peak emissions during Proposed Project activities. These emissions estimates were reviewed and revised accordingly to ensure that the estimate uses reasonable assumptions and proper calculation methods. The final emissions estimates for the Proposed Project are provided in Appendix E1. The final worst-case daily emissions estimates for the work peak period, estimated to occur in 2023, compared to the significance thresholds (Table 4.3-4) are provided in Table 4.3-5.

Table 4.3-4. Screening-Level Thresholds

Pollutant	Emissions Thresholds			
	San Diego County[1]			Other Areas
	Pounds/Hour	Pounds/Day	Tons/Year	Pounds/Day
Respirable particulate matter (PM_{10})	-	100	15	150 [2,3]
Fine particulate matter ($PM_{2.5}$)	-	55	10	55 [2]
Oxides of Nitrogen (NO_x)	25	250	40	100 [2,3]
Oxides of Sulfur (SO_x)	25	250	40	150 [2]
Carbon Monoxide (CO)	100	550	100	550 [2,3]
Volatile Organic Compounds (VOCs)	-	75	13.7	75 [2,3]

Sources: [1] County of San Diego 2007b; [2] SCAQMD 2015; [3] ICAPCD 2007.

Table 4.3-5. Unmitigated Peak Daily Emissions (lbs/day)

Emissions by Jurisdiction		PM_{10}	$PM_{2.5}$	NO_x	CO	SO_x	VOC
San Diego APCD	Total Maximum Daily Emissions	34.75	16.43	211.70	165.62	0.45	24.32
	Screening-Level Thresholds	100	55	250	550	250	75
	Significant?	**No**	**No**	**No**	**No**	**No**	**No**
	Total Maximum Daily Emissions	18.76	8.45	213.43	105.53	0.69	15.44

Emissions by Jurisdiction		PM_{10}	$PM_{2.5}$	NO_x	CO	SO_x	VOC
South Coast AQMD	Screening-Level Thresholds	150	55	100	550	150	75
	Significant?	**No**	**No**	**Yes**	**No**	**No**	**No**
Mojave AQMD	Total Maximum Daily Emissions	4.38	2.83	111.81	34.17	0.19	4.17
	Screening-Level Thresholds	150	55	100	550	150	75
	Significant?	**No**	**No**	**Yes**	**No**	**No**	**No**
Imperial County APCD	Total Maximum Daily Emissions	0.17	0.05	0.80	0.15	0.01	0.03
	Screening-Level Thresholds	150	55	100	550	150	75
	Significant?	**No**	**No**	**No**	**No**	**No**	**No**

Sources: Emission – Appendix E; Significance Thresholds – County of San Diego 2007b; SCAQMD 2015; ICAPCD 2007.
Note: The emissions estimate is a maximum peak daily rate. These peak daily rates are used to compare to the San Diego County hourly and annual emissions significance thresholds.

A review of peak daily emissions and daily work time assumptions for the emissions sources allows the following findings to be made regarding San Diego County's hourly and annual screening-level emissions thresholds:

- Peak hourly NO_X emissions exceed the San Diego County hourly screening-level threshold of 25 pounds per hour. This finding assumes that the peak hourly emissions could include at least one-sixth of the daily terrestrial emissions. This is based on one-shift of operation at the Proposed Project site, with the peak hour being somewhat higher than the average hour. The emissions included in this assessment are the on-site equipment, the off-site vehicles, and the marine emissions during the worst-case overlap period. However, the emissions included to determine this finding do not include the nighttime Pacific Sun Railroad and Burlington Northern Santa Fe (BNSF) locomotive emissions.
- Annual emissions in the peak year are estimated and summarized in Appendix E1, and the emissions of all criteria pollutants are well below the San Diego County annual screening-level emissions thresholds.

Peak daily NO_X emissions would exceed applicable daily screening-level thresholds in both SCAQMD and MDAQMD, but would be below the daily screening-level thresholds for SDAPCD and ICAPCD, as shown in Table 4.3-5. Although NO_X emissions would exceed the hourly screening-level threshold in SDAPCD, the most appropriate standards used to assess the effects of construction and operational emissions in San Diego County are daily screening-level thresholds as recognized by the County of San Diego's guidance for CEQA significance thresholds (County of San Diego 2007). Therefore, the Proposed Project would have less than significant impacts in SCAPCD and ICAPCD. Because Proposed Project NO_X emissions would exceed the daily thresholds for both SCAQMD and MDAQMD, Proposed Project air quality impacts would be significant for NO_X in those air districts. MM AQ-3a, which requires Tier 4 equipment, is still needed to ensure emissions are below the County of San Diego daily significance threshold for NO_X.

NO_X emissions have a number of environmental impacts, including health impacts related to NO_2 and secondary ozone and fine particulate formation; as well as impacts to the environment related to acid rain and nitrate formation that causes haze, and nutrient pollution that impacts coastal waters and other sensitive environments such as deserts, lakes, and forests (USEPA 2019). Specifically, in terms of health impacts, NO_X emissions, (which are emitted as a mix of different NO_X compounds, primarily NO [nitric oxide] that is quickly oxidized to NO_2), can have direct localized impacts related to high downwind NO_2 concentrations, and more regional impacts related to secondary ozone and fine particulate formation. High concentrations of NO_2 can irritate airways and exposures over short periods can aggravate respiratory diseases, such as asthma, leading to an increase in emergency room visits and hospitalization (CARB 2009, USEPA 2019, CAPCOA 2019). Longer exposures to high NO_2 concentrations can likely contribute to the development of asthma and increase susceptabiltiy to respiratory infections. People with asthma, as well as children and the elderly, are generally at greater risk of health effects of NO_2 (USEPA 2019). The secondary health effects of NO_X emissions include the regional formation of ozone, which causes breathing difficulties, aggravates asthma, causes lung tissue damage, and increases susceptibility to respiratory infections; and fine particulate, which can increase respiratory disease, cause lung damage, cardiac arrhtymias, and heart attacks, and cause premature death (CARB 2009, CAPCOA 2019).

However, the regional emissions significance thresholds used in this impact assessment, (recommended for use by each local air district) are not directly related to health impacts, and certainly not related to substantial health effects. The significance criteria are related to regional air quality planning efforts that establish emissions levels that would not affect the regional planning efforts by each district. Therefore, Proposed Project-level exceedances of these regional thresholds cannot be directly correlated to significant health effects.

The Proposed Project's NO_X emissions that exceed these regional thresholds (SCAQMD and MDAQMD) are transportation related (truck and rail tranport) emissions that occur over vast areas of the two regions where the NO_X emissions significance standard is currently exceeded. The Proposed Project's maximum daily NO_X emissions in SCAQMD's SCAB and MDAQMD's jurisdiction, which relate to 0.009 percent and 0.06 percent of the NO_X emissions in these areas,[35] respectively, would not have the potential to cause high localized concentration of NO_2, ozone, or fine particulate at any fixed receptor location. Therefore, they would also not cause a substantial health impact. See also Impacts AQ-2 and AQ-4, for additional air pollutant health impact discussions.

For the four California jurisdictions directly impacted by the Proposed Project, most unmitigated emissions are estimated to be below their screening-level emissions

[35] Table 4.3-5 maximum daily emissions estimates compared to the CARB CEPAM 2023 emissions inventory forecast (https://www.arb.ca.gov/app/emsinv/fcemssumcat/fcemssumcat2016.php) for the SCAQMD SCAB and MDAQMD areas, respectively.

thresholds. However, the following emissions which were found to exceed the screening-level emissions thresholds for NO_X within the following jurisdictions: (1) SDAPCD (hourly emissions); (2) SCAQMD (daily emissions); and (3) MDAQMD (daily emissions). Most of the NO_X emissions would be from truck traffic and marine vessels within SCAQMD jurisdiction, and from rail locomotives within MDAQMD jurisdiction (see Appendix E1).

Mitigation that would be effective must feasibly control emissions for the major NO_X sources: off-road equipment, heavy haul trucks, marine vessels, and locomotives. However, NO_X MMs are constrained by what the Applicant can directly address or impose on the decommissioning contractor(s). For example, the Applicant cannot impose locomotive emissions standards on Sun Pacific Railroad or BNSF, so locomotive emissions mitigation is not considered feasible. However, the imposition of emissions standards on off-road equipment, trucks, and marine vessels used is feasible as these services would be competitively bid services where these requirements can be required through contract stipulations. The level of the imposed mitigation is an additional constraint that must be considered, such as the availability of marine vessels with engines that meet any given emissions tier standard. SCE commits to the following Applicant Proposed Measure (APM) to minimize impacts due to emissions (see Table 4-2, *Applicant Proposed Measures*).

APM-3: Vehicle Emission Reductions. The Applicant ~~and/~~or its contractor shall, employ vehicle emissions reduction measures which could include, but are not limited to: the use of newer model engines (model year 2010 and newer), low emissions diesel products, alternative fuels, engine retrofit technology, after-treatment products, or other similar available options. The following exceptions apply:

- This measure does not apply to any gasoline-fueled or other alternatively fueled heavy-duty haul trucks, but does apply to trucks using other types of fuel such as diesel.
- This measure does not apply to the trucks used to haul radioactive Class B or C decommissioning wastes.

This APM would apply to most of the haul trucks that would be used, almost all of which would likely be fueled by diesel, not gasoline or alternative fuels; and the amount of Class B and C waste trips are negligible in comparison with the other haul trips. The emissions calculations assume all heavy-haul trucks are diesel-fueled, and any gasoline-fueled or alternatively fueled heavy-duty trucks do not require any mitigation as they would have much lower NO_X emissions than uncontrolled heavy haul diesel-fuel trucks.

With implementation of APM-3, the impact related to NO_X emissions would be reduced, but not to a less-than-significant level.

Mitigation Measures

The MMs provided below are recommended to further reduce the Proposed Project's NO_X emissions to the maximum feasible extent.

MM AQ-3a: Off-Road Equipment Emissions Control. Off-road diesel-fueled equipment, not including locomotive and marine vessel engines, with engines larger than 50 horsepower shall have engines that meet or exceed U.S. Environmental Protection Agency/California Air Resources Board full Tier 4 emissions standards. This includes Project-related off-road equipment operating at the SONGS site and the Project-related equipment operating at the Port of Long Beach/Los Angeles. Exceptions shall be allowed only on a case-by-case basis for three specific situations: (1) interim Tier 4 equipment shall be allowed in place of full Tier 4 equipment through the end of calendar year 2020; (2) off-road equipment items that are a specialty, or unique, piece of equipment that cannot be found with a Tier 4 or better engine after a due diligence search that includes contacting at least three relevant equipment rental firms; and (3) an off-road equipment item that shall be used for a total of no more than 10 days. Additionally, all engines shall be maintained in good operating condition and in tune per manufacturers' specification.

MM AQ-3b: Marine Vessel Emissions Control. The Applicant or its contractor shall ensure that diesel-fueled marine vessel engines (37 kilowatt or larger) meet or exceed U.S. Environmental Protection Agency Tier 2 emissions standards.

Residual Impacts

While the proposed MMs would help reduce the Proposed Project's NO_X emissions, those emissions, specifically the daily NO_X emissions within the SCAQMD, would remain above the screening-level emissions threshold. Therefore, the residual impacts would remain significant and unavoidable.

Impact AQ-4: Expose Sensitive Receptors to Substantial Pollutant Concentrations.

The Proposed Project could expose sensitive receptors to substantial pollutant concentrations **(Less than Significant).**

Impact Discussion

The Proposed Project site is located almost 0.75 mile from the nearest residential receptor and more than 1 mile from the nearest school at the closest site boundary. The offshore work would be even further away from sensitive receptors. A large proportion of the Proposed Project's emissions, including diesel particulate matter emissions, are transportation-related emissions that would disperse over a large area. The transportation emissions impact at any given receptor location would be limited to a small amount of emissions related to a very short segment of these long transportation routes, where those limited localized emissions would be well below levels that could cause substantial

sensitive receptor impacts. Components of the Proposed Project that would reduce emission impacts to sensitive receptors include:

- The Proposed Project's timeline occurs after USEPA/CARB regulations have substantially reduced emissions, including diesel particulate matter emissions, in the state-wide off-road equipment and on-road heavy-duty truck fleets. Please see Appendix A for a discussion of these regulations.
- Compliance with the SDAPCD Rule 55 would reduce fugitive dust emissions and associated impacts to sensitive receptors.
- The nearest sensitive receptors within the MCBCP, and other sensitive receptors located in south Orange County within a few miles of SONGS, are in a direction from SONGS that is perpendicular to the predominate onshore and offshore wind directions at the SONGS site (see Figure 4.2-1), which would minimize impacts.

Given the low Valley Fever incidence rate in San Diego County and because fugitive dust-generating activities associated with the Proposed Project would not occur near a heavily populated area (i.e., off-site sensitive receptors – see Section 4.3.1.4, *Sensitive Receptors*), the potential for the Proposed Project D&D activities to encounter and disperse CI spores and create the potential for additional Valley Fever infections among the public is negligible.

Given the distance to sensitive receptors and their direction from SONGS, the Proposed Project's on-site and offshore diesel particulate matter emissions are not of a magnitude that could create significant air toxic health risks to the nearest sensitive receptors; and the other pollutants are not of a magnitude that could create substantive concentrations of other air pollutants at sensitive receptor locations.

In addition to the emissions reductions measures that would reduce the Proposed Project's air pollutant emissions, the following specific factors and assumptions have been used to make this finding:

- While the Proposed Project has been found to have significant impacts related to regional NO_X emissions in the South Coast Air Basin, those impacts relate to SCAQMD air quality planning efforts that consider the sum of regional pollutant impacts that would occur from a multitude of regional projects. This regional impact finding does not specifically mean the Proposed Project would cause new air pollutant standard exceedances, substantially increase any existing exceedances, or cause substantial pollutant concentrations at sensitive receptor locations.
- Sensitive receptors are not located near the Proposed Project's concentrated emissions areas (i.e., sensitive receptors are not located near, within 500 meters or less, of the SONGS site or the offshore construction areas).
- It is not feasible to model the criteria pollutant emissions (and their related health impacts) given the large area within several air basins in which they are emitted,

and no standardized dose-response guidance is available for low-level increases in criteria pollutant concentrations to assess project-level effects and health impacts.

- While the Proposed Project would create new emissions over the life of the Proposed Project, the emissions from most existing emission sources are forecast to decrease over time, much more than the increase caused by the Proposed Project, which would actually reduce existing criteria pollutant health impact incident rates. Therefore, although it is not feasible to to model the criteria pollutant emissions and related health impacts (as described in the paragraph above), health impact incident rates are expected to decline over time during the life of the Proposed Project.
- If the Proposed Project, which is adjacent to SCAQMD's jurisdiction, were to be assessed using the SCAQMD localized significance thresholds (LSTs) it would be found to have emissions below these emissions thresholds (pounds per day thresholds for NO_X, CO, PM_{10} and $PM_{2.5}$). The SCAQMD LSTs were developed to assess whether a project could cause substantial pollutant concentrations at sensitive receptor locations by identifying project emissions rates that, along with the local ambient pollutant levels, may impact the health of sensitive receptors.

So, while the Proposed Project would create new pollutant emissions that would have a temporary adverse impact on air pollutant concentrations and therefore a temporary adverse effect on public health, the Proposed Project would only create marginal increases in criteria pollutant concentrations and would not create substantial pollutant concentrations or substantially increase existing pollutant concentrations. Therefore, the Proposed Project's air pollutant emissions would not expose sensitive receptors to substantial pollutant concentrations and would result in a less-than-significant impact.

SCE commits to the following APMs to further ensure that impacts due to fugitive dust would be minimized.

APM-3: Vehicle Emission Reductions.

APM-4: Dust Suppression. During Proposed Project activities, disturbed Project area surfaces, including unpaved access roads, shall be effectively stabilized of dust emissions (e.g., watered, covered, stabilized, or treated with a dust suppressant), consistent with the Storm Water Pollution and Prevention Plan.

APM-5: Vehicle Speeds. Decommissioning crew vehicle speeds on unpaved roadways shall be restricted to 15 miles per hour or less, in accordance with SONGS procedures.

APM-6: Track-Out to Public Streets. Gravel or track-out control devices, such as shaker plates, shall be installed at the points of egress from the unpaved or disturbed surfaces, consistent with the Storm Water Pollution and Prevention Plan.

APM-7: Tarping Trucks. Consistent with the Storm Water Pollution and Prevention Plan, haul trucks transporting material with potential to generate fugitive dust emissions to and from the site shall be tarped from the point of origin until point of delivery. For trucks that cannot be tarped, the Applicant ~~and/~~or its contractor shall stabilize material while loading to reduce fugitive dust emissions; maintain at least 6 inches of freeboard on haul vehicles; and, stabilize material while transporting.

APM-3 through APM-7 would further reduce impacts related to fugitive dust, which would remain less than significant.

Mitigation Measures

In addition, **MM AQ-3a** and **MM AQ-3b** recommended under Impact AQ-3 would further reduce the Proposed Project's adverse, but less than significant, sensitive receptor impacts related to ~~significant~~ diesel particulate matter emissions.

MM AQ-3a: Off-Road Equipment Emissions Control.

MM AQ-3b: Marine Vessel Emissions Control.

Impact AQ-5: Create Objectionable Odors Affecting a Substantial Number of People.

The Proposed Project could create objectionable odors affecting a substantial number of people **(Less than Significant).**

Impact Discussion

Some objectionable odors may be temporarily created during demolition-related activities, such as from equipment and vehicle diesel exhaust, ocean bottom waste decomposition, and decomposition of plant and animal life on the removed vertical structures. However, the Proposed Project's on-site odors would not be overly offensive, would dissipate quickly, and would not affect a substantial number of people due to the sparsely populated nature of the area surrounding SONGS. The intake and discharge conduit wastes may have a limited amount of associated organic material (e.g., algae, animal wastes, attached and microscopic organisms, etc.) that could be subject to decomposition; however, the removal action would intentionally limit removal of unnecessary ocean bottom wastes, including such organic materials. The excavated discharge conduit wastes and removed vertical structures would be located offshore on a barge for a limited time before being shipped to the POLB/POLA, which are also areas not near residential receptors, where the waste would be transferred to containers for shipment by truck for disposal. Therefore, due to the limited odor sources and the distance to odor receptors, a less-than-significant impact related to odors would occur.

Mitigation Measures

No MMs are recommended for Impact AQ-5.

4.3.5 Cumulative Impacts

As discussed in Section 3.2, *Relevant Cumulative Projects*, and shown in Table 3-2, all listed reasonably foreseeable cumulative projects fall within the geographic area near SONGS considered for potential cumulative impacts related to air quality; and seven cumulative projects may be located within 1 mile of the Project site:

- SONGS Independent Spent Fuel Storage Installation (#1)
- SONGS Mesa Environmental Investigation and Remediation (#2)
- SONGS Riprap and Public Access Walkway Repairs (#5)
- I-5 North Coast Corridor Project (#20)
- Basewide Utility Infrastructure (#23)
- Basewide Water Infrastructure (#24)
- LOSSAN Coastal Rail Corridor Improvements (#43)

Due to the distance between the Proposed Project and the seven nearby cumulative projects, the type and size of the proximate cumulative projects, and distance to nearby sensitive receptors, the Proposed Project's cumulative effects for the following impacts can be determined to be less than significant:

- The Proposed Project would not have significant odor sources, and so could not create a considerable contribution to odor impacts (Impact AQ-5).
- The Proposed Project's emissions are not of a magnitude that could combine with the emissions from the other proximate cumulative projects to cause new or substantially worsen existing AAQS violations (Impact AQ-2).
- The Proposed Project's emissions would not create considerable contributions to significant localized health risk impacts or provide a considerable contribution to other localized substantial pollutant concentrations at sensitive receptor locations (Impact AQ-4).

Furthermore, impacts related to conformance with relevant air quality plans and policies (Impact AQ-1) is a project-specific impact and is not a cumulative impact issue.

The Proposed Project would create mitigated NO_X emissions levels from truck traffic and marine vessels within SCAQMD jurisdiction that exceed screening-level emissions thresholds (Impact AQ-3). The Proposed Project's substantive contributions to SCAQMD regional NO_X emissions could combine with the air quality effects from all cumulative projects listed in Table 3-2 that are within the South Coast Air Basin. The measures to reduce NO_X impacts (APM-3, MM AQ-3a, and MM AQ-3b) reduce the Proposed Project's

emissions to the maximum feasible extent, and no additional mitigation would address the Proposed Project's significant and unavoidable cumulative NO_X emissions impact.

4.3.6 Future Activities

Future activities that may generate emissions include the following:

- Ongoing operations and maintenance of the Approved ISFSI, personnel commuting, and SNF packaging and shipment, which may be substantial. Given the uncertainties of the timing of the Approved ISFSI removal and the location of the SNF repository, air pollutant emissions for this work have not been estimated.
- Emissions related to removing the solid covers on the mammal exclusion barriers of the Unit 2 discharge conduit and, if required by the Commission, removing remaining discharge conduit diffuser ports, which would involve the use of marine vessel(s). Air pollutant emissions for this work have not been estimated.
- Air pollutant emissions resulting from DoN's requirements for final site restoration are speculative at this time and have not been estimated. The basis for emissions factors ~~are~~ is also speculative, as the current emissions factor models do not forecast emissions factors for vehicles and equipment over 30 years in the future.

The emissions potential for Future Activities involving the Approved ISFSI, while not completely understood at this time, should be well below the worst-case daily emissions identified above for the Proposed Project, due to the decreased level of work anticipated and implementation of unknown technological advances expected to reduce emissions by the time Future Activities take place. The emissions potential for DoN requirements has a very large range. If the DoN requires only limited additional restoration work at the site after completion of the Proposed Project, then air quality impacts would be less than significant. However, if full restoration to pre-SONGS conditions is required, then the air quality impacts for certain pollutants, such as PM_{10} (due to fugitive dust emissions from extensive earthmoving activities), could be significant and unavoidable. Emissions associated with removing the remaining discharge conduit diffuser ports would be similar to the Proposed Project's daily emissions from similar offshore work, where 12 diffuser ports would be removed, but would be below the maximum daily onshore and offshore combined peak emissions from the Proposed Project. If impacts from Future Activities are found to be significant, implementation of measures such as APM-3 through APM-7, **MM AQ-3a**, and **MM AQ-3b** may be appropriate.

4.3.7 Summary of Proposed Mitigation Measures

Table 4.3-6 provides a summary of the mitigation and Applicant-proposed measures.

Table 4.3-6. Air Quality Impact/Mitigation Summary

Impact	MM/APM
AQ-1: Conflict or Obstruct Implementation of Applicable Air Quality Plans	None recommended
AQ-2: Violation of Air Quality Standards	None recommended
AQ-3: Result in a Cumulatively Considerable Net Increase of Any Criteria Air Pollutant for which the Project Region is in Nonattainment	APM-3: Vehicle Emission Reductions MM AQ-3a. Off-Road Equipment Emissions Control MM AQ-3b. Marine Vessel Emissions Control
AQ-4: Expose Sensitive Receptors to Substantial Pollutant Concentrations	APM-3: Vehicle Emission Reductions APM-4: Dust Suppression APM-5: Vehicle Speeds APM-6: Track-Out to Public Streets APM-7: Tarping Trucks MM AQ-3a. Off-Road Equipment Emissions Control MM AQ-3b. Marine Vessel Emissions Control
AQ-5: Create Objectionable Odors Affecting a Substantial Number of People	None recommended

4.4 BIOLOGICAL RESOURCES

This section describes terrestrial and marine species and habitats in the Proposed Project area that would be affected by decommissioning activities, identifies applicable significance thresholds, assesses the Proposed Project's impacts to terrestrial and marine biological resources and their significance, and recommends measures to avoid or substantially reduce any effects found to be potentially significant. The environmental setting for this Environmental Impact Report (EIR) is based on information in the Marine Corps Base Camp Pendleton (MCBCP) *Integrated Natural Resources Management Plan* (INRMP) (MCBCP 2012) and other technical studies, including field observations at and offshore the San Onofre Nuclear Generating Station (SONGS) prepared for Southern California Edison (SCE) by CH2M Hill, Coastal Environments, and MBC Applied Environmental Sciences (MBC) that were peer reviewed by California State Lands Commission (CSLC) contracted biologists.

Where applicable, this section identifies Special-Status Species, Special Animals, and Essential Fish Habitat. Appendix F1, *Regional Special Status Species Tables*, summarizes the habitat, distribution, conservation status, and potential for occurrence in the Proposed Project area of special-status plants (Table F1-1), terrestrial wildlife (Table F1-2) and marine mammals, marine birds, and sea turtles (Tables F1-3 through F1-5). These species meet one or more of the criteria listed below.

- Species listed as threatened or endangered under the Federal Endangered Species Act (FESA) (50 Code of Federal Regulations [CFR] Parts 17.11 [animals] and 17.12 [plants] and notices in the Federal Register [FR or are candidates for future listing as threatened or endangered under the FESA (74 FR 57804, November 9, 2009) are classified as: **FE** = Federally Endangered; **FT** = Federally Threatened; **BCC** = USFWS Birds of Conservation Concern.
- Species the State has listed or proposed to list as threatened or endangered under the California Endangered Species Act (CESA) (Cal. Code Regs., tit. 14, § 670.5) or designated by the California Department of Fish and Wildlife (CDFW) as Species of Special Concern, Watch List Species, or species that are considered rare and worthy of consideration by local agencies are classified as: **SE** = State Endangered; **ST** = State Threatened; **SR** = State Rare; **SSC** = California Species of Special Concern; **FP** = CDFW Fully Protected.
- Plants listed as rare under Fish and Game Code, section 1900 et seq. or considered by the California Native Plant Society pursuant to the California Rare Plant Rank [CRPR] are classified as: **CRPR 1A** = Presumed extinct in California; **CRPR 1B** = Rare or endangered in California and elsewhere; **CRPR 2** = Rare or endangered in California, more common elsewhere; **CRPR 3** = More information needed; **CRPR 4** = Limited distribution (Watch List). **CRPR sub-categories** are:

.1 = Seriously endangered in California (over 80 percent of occurrences threatened/high degree and immediacy of threat)

.2 = Fairly endangered in California (20 to 80 percent occurrences threatened)

.3 = Not very endangered in California (less than 20 percent of occurrences threatened or no current threats known)

"Special Animals," which are taxa tracked by the CDFW California Natural Diversity Database (CNDDB) regardless of their status, are species, subspecies, or Evolutionarily Significant Units (ESU) where one or more of the following conditions apply:

- Officially listed or proposed for listing under FESA/CESA
- Taxa considered by the CDFW to be a SSC
- Taxa that meet the criteria for listing, even if not currently included on any list, as described in State CEQA Guidelines section 15380
- Taxa that are biologically rare, very restricted in distribution, or declining throughout their range but not currently threatened with extirpation
- Population(s) in California that may be peripheral to the major portion of a taxon's range but are threatened with extirpation in California
- Taxa closely associated with a habitat that is declining in California at a significant rate (e.g., wetlands, riparian, vernal pools, old growth forests, desert aquatic systems, native grasslands, valley shrubland habitats)
- Special-status, sensitive, or declining species designated by state or federal agencies or non-governmental organizations and determined by the CNDDB to be rare, restricted, declining, or threatened across their range in the State

Marine mammals are also protected under the Marine Mammal Protection Act of 1972 (MMPA), which prohibits the take, import, or export of marine mammals without a permit.

The Magnuson-Stevens Act of 1976 as amended by the Sustainable Fisheries Act of 1996 (Public Laws 104-267 and 104-297) requires the National Marine Fisheries Service (NMFS), regional Fishery Management Councils (FMCs), and other federal agencies to identify and protect important marine, estuarine, and anadromous fish habitat. Regional FMCs, such as the Pacific FMC [PFMC], prepare Fishery Management Plans (FMPs) to identify, protect, and enhance Essential Fish Habitat (EFH) for federally "managed species." EFH is defined as "those waters and substrates necessary to fish for spawning, breeding, feeding or growth to maturity" (16 United States Code [U.S.C.] 1802 (10)). In 2002, NMFS further clarified EFH with the following definitions:

- "Waters" include aquatic areas and their associated physical, chemical, and biological properties that are used by fish.

- "Substrate" includes sediment, hard bottom, structures underlying the waters, and associated biological communities.
- "Necessary" includes the managed species' contribution to a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle (50 CFR Part 600.10).

Table F1-6 in Appendix F identifies fish species that could occur offshore SONGS that are covered under four FMPs: Coastal Pelagic Species (CPS); Pacific Coast Groundfish (PCG); Pacific Coast Salmon (PCS); and Highly Migratory Species (HMS). Not all these species have been recorded in surveys reviewed for this assessment; their likelihood of occurrence depends on the habitat types in the area and each species life history, including range and habitat use. The taxa listed may occur in the area as egg, larvae, juvenile, or adult forms.

4.4.1 Environmental Setting (Terrestrial)

The SONGS facility is in northern San Diego County, which has a Mediterranean climate with warm, dry summers and mild, wet winters. Yearly conditions are variable, resulting in vegetation adapted to periodic drought, flooding, and wildfires. The surrounding MCBCP includes the largest remaining tract of land in coastal southern California with minimal development and expansive habitat that supports hundreds of invertebrate species, more than 50 mammals, 30 reptiles, 10 amphibians, 300 birds, and 60 fish species (MCBCP 2012). Many species are year-round residents of MCBCP; others are migratory, inhabiting the MCBCP seasonally or using it as a corridor to the Cleveland National Forest or other areas. Figures 4.4-2 through 4.4-4 show special-status terrestrial species and habitats in the study area (see also Appendix F1, Tables F1-1 and F1-2).

The terrestrial study area includes the SONGS facility plus a 25-foot buffer on the southeast (to the pedestrian walkway) and northwest (to the railroad right-of-way). Figure 4.4-1 shows land cover types in this study area. The Proposed Project ~~o~~Onshore ~~s~~Site includes 99 acres; an 84-acre easement for the primary nuclear facilities (DoN Easement) in the southeastern two-thirds of the study area, and about 15 acres of employee parking and equipment staging and storage areas in DoN-leased parcels immediately northwest. Northwest of the latter parcels lies the San Onofre Vernal Pool Restoration Area managed by MCBCP in coordination with California Department of Parks and Recreation (DPR) and U. S. Fish and Wildlife Service (USFWS). The study area also includes: 1.3 miles of Old Pacific Highway (Old Highway 101); 1 mile of Beach Club Road; about 1.7 miles of shoreline above the high-tide line within San Onofre State Beach; vegetated areas along roads and atop coastal bluffs up to 120 feet above mean lower low water (MLLW) south of SONGS and surrounding the Vernal Pool Restoration Area; and shoreline protection devices (riprap revetment, concrete bulkhead supporting a public access walkway, and seawall) extending for about 2,000 feet along the shoreline in front of SONGS.

Figure 4.4-1. Terrestrial Study Area Land Cover Types

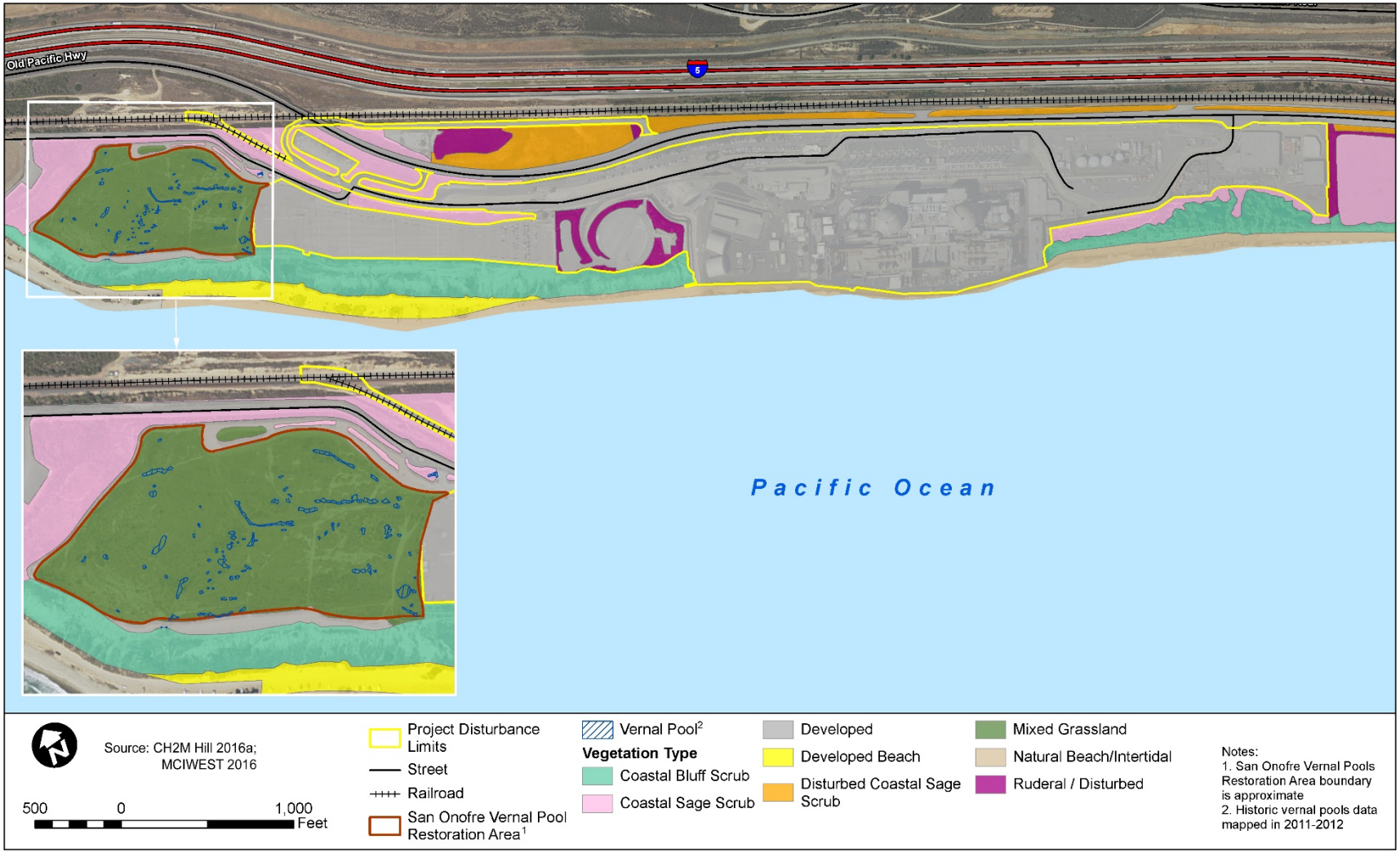


Figure 4.4-2. Special-Status Plant Occurrences

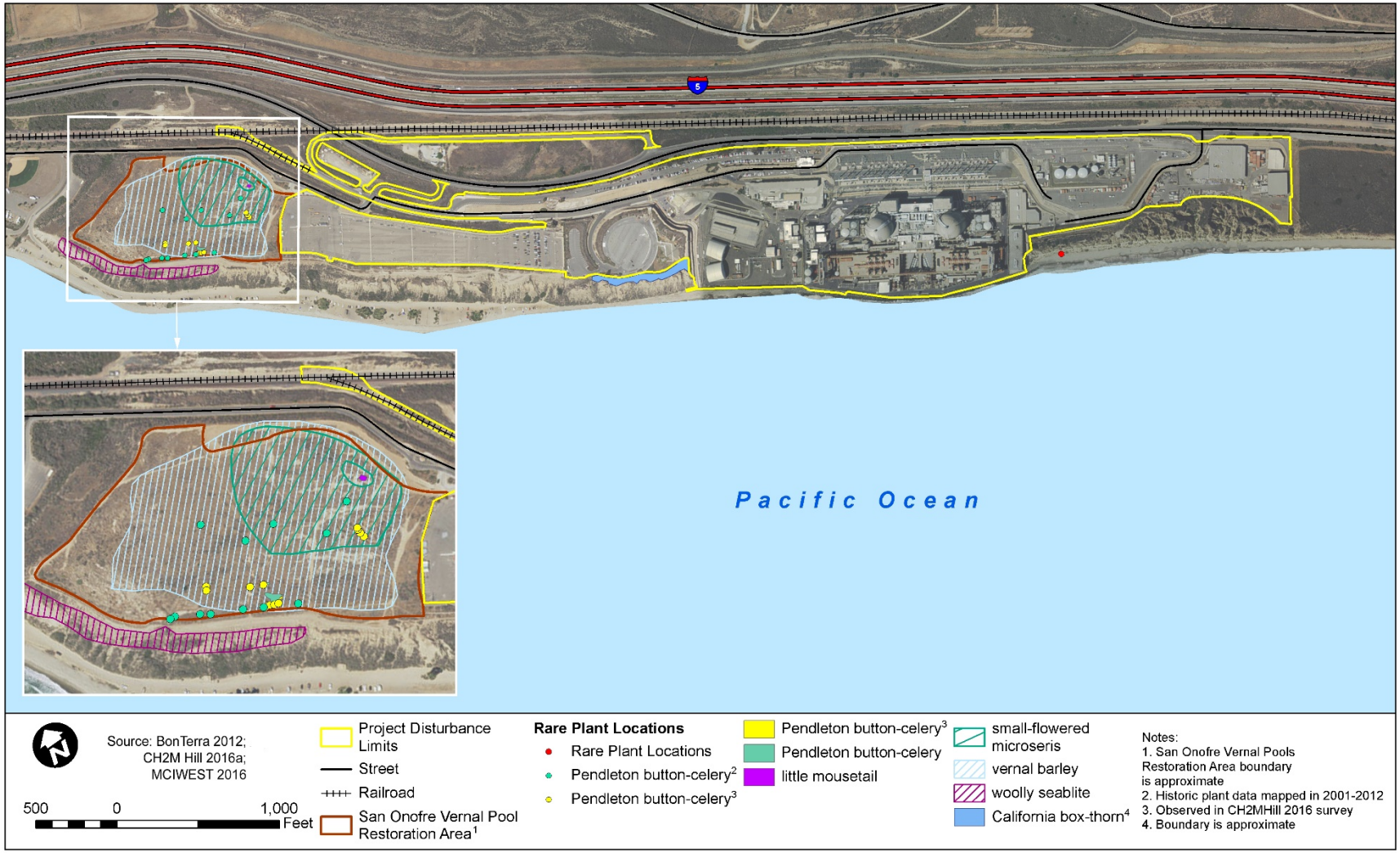


Figure 4.4-3. Coastal California Gnatcatcher Occurrences

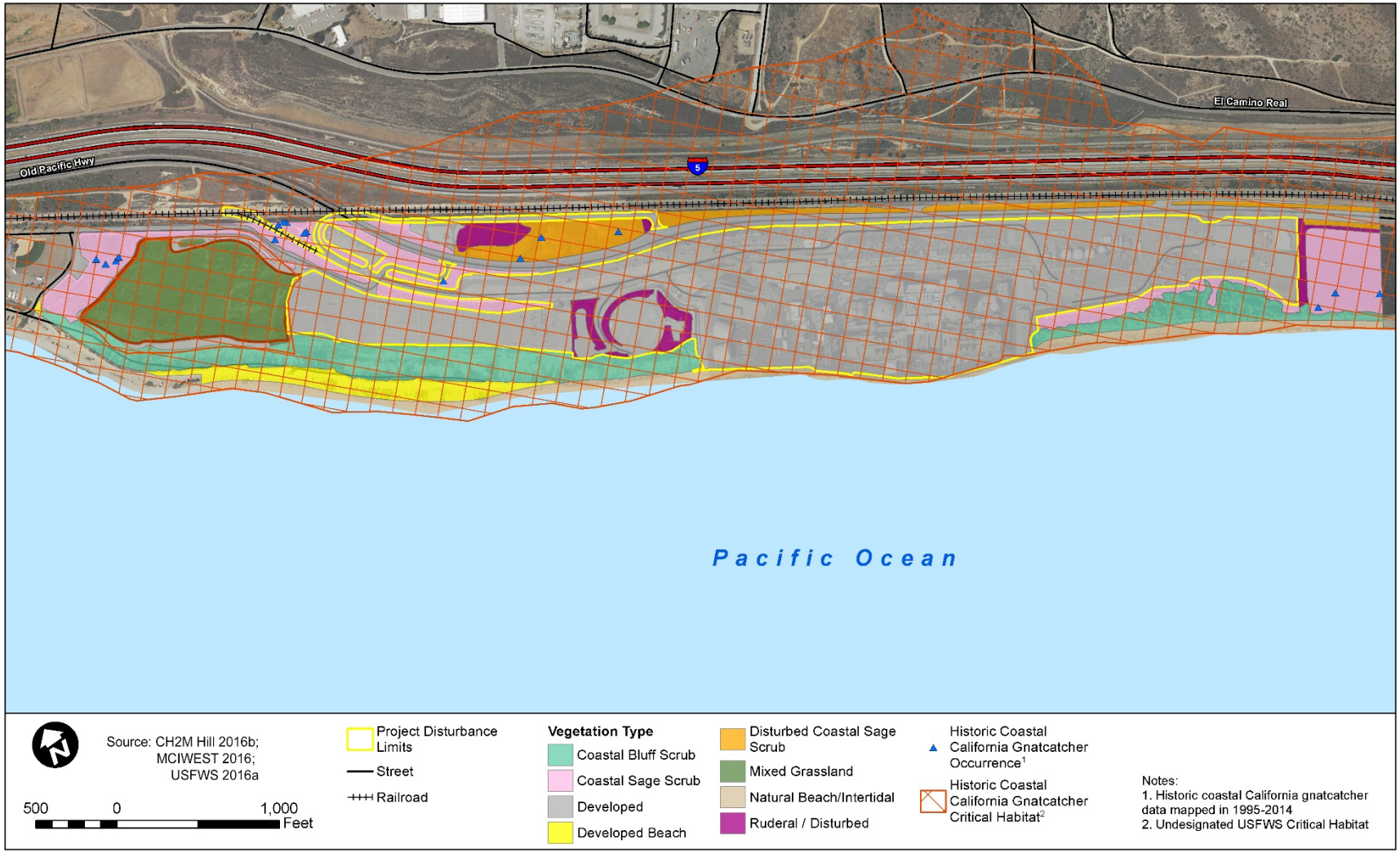
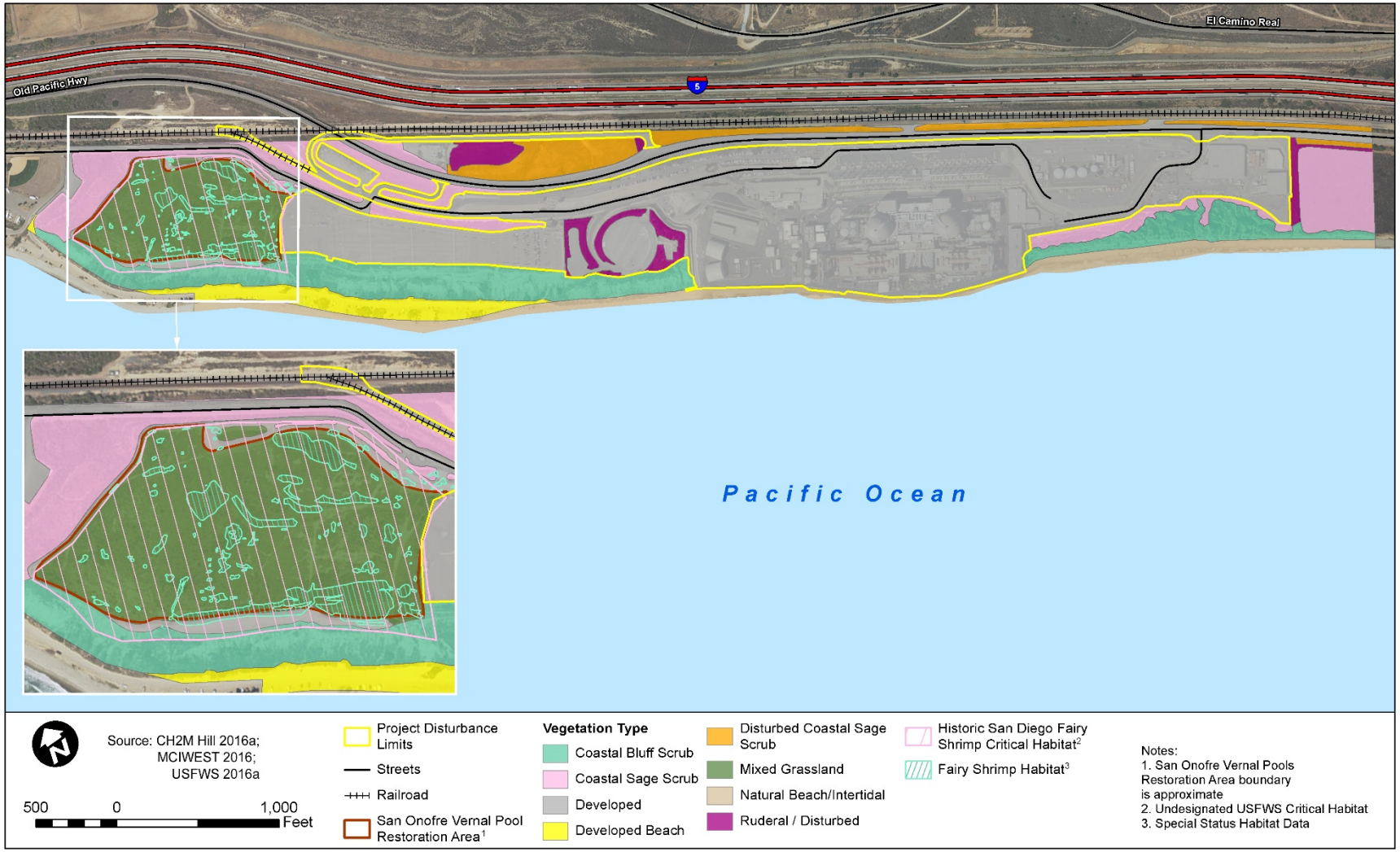


Figure 4.4-4. Fairy Shrimp Occurrences



4.4.1.1 Vegetation Communities and Land Cover Types

Vegetation communities and land cover types throughout the terrestrial study area were mapped and described by CH2M Hill (2016a). The associated acreages observed in the study area are summarized in Table 4.4-1 and illustrated in Figure 4.4-1 above.

Table 4.4-1. Terrestrial Vegetation and Land Cover Types

Vegetation/Land Cover Types[1]	Department of the Navy (DoN)		Buffer Areas	Total (acres)
	Easement Area[2]	Leased Parcels		
Coastal Sage Scrub	2.51	1.17	15.61	**19.30**
Disturbed Coastal Sage Scrub	0	0	8.21	**8.21**
Coastal Bluff Scrub	7.61	0.52	12.89	**21.03**
Mixed Grassland	0	0.08	14.01	**14.09**
Vernal Pools	0	0	0.42	**0.42**
Ruderal/Disturbed	2.37	0.0004	2.18	**4.55**
Developed Beach	0	0	2.78	**2.78**
Developed	65.22	13.10	24.72	**103.04**
Total	**77.71**	**14.88**	**80.83**	**174.31**

Notes:

[1] The terrestrial study area includes the SONGS site and a 25-foot buffer on the southeast (to the pedestrian walkway) and northwest (to the railroad right-of-way). Acreages include terrestrial habitat and land cover types and exclude areas of natural beach/intertidal zone in the marine Project area (CH2M Hill 2016a).

[2] Acreage shown for DoN Easement Area does not include natural beach/intertidal cover; therefore, the terrestrial study area acreage is less than the total acreage of the DoN Easement Area.

Scrub Communities

Coastal sage scrub is common in the terrestrial study area (19.3 acres). Special status species with the potential to occur in this area include thread-leaved brodiaea (*Brodiaea filifolia*; SE, FT, CRPR 1B.1), Aphanisma (*Aphanisma blitoides*; CRPR 1B.2), and many stemmed dudleya (*Dudleya multicaulis*; CRPR 1B.2), while Blochman's dudleya (*Dudleya blochmaniae* ssp. *Blochmaniae*; CRPR 1B.1) and chaparral ragwort (*Senecio aphanactis*; CRPR 2.B.2) have been recorded within 3 miles of the Proposed Project site. The study area is characterized by California sagebrush (*Artemisia californica*) in association with other shrubs and sub-shrubs including coyote bush (*Baccharis pilularis*), elderberry (*Sambucus nigra* ssp. *carulea*), lemonade berry (*Rhus integrifolia*), laurel sumac (*Malosoma laurina*), bladder-pod (*Peritoma arborea*), California brittlebush (*Encelia californica*), common deerweed (*Acmispon glaber* var. *glaber*), and California buckwheat (*Eriogonum fasciulatum*). In some areas, shrubs form dense, continuous canopies with little to no herbaceous understory vegetation. In the northwestern portion of the study area, herbs are more widely scattered and intermixed with grasses and forbs such as red brome (*Bromus madritensis*), slender wild oat (*Avena barbata*), rip-gut brome (*Bromus diandrus*), fennel (*Foeniculum vulgare*), crystalline iceplant (*Mesembryanthemum crystallinum*), tocalote (*Centaurea melitensis*), and Bermuda buttercup (*Oxalis*

pescaprae). Occasional locally dense patches of coyote bush and elderberry were found within this vegetation type, but were too small to be mapped (CH2M Hill 2016a).

Disturbed coastal sage scrub (8.21 acres) generally occurs along existing roads in areas between Old Pacific Highway and the railroad tracks in the northern part of the study area (CH2M Hill 2016a). Compared to undisturbed coastal sage scrub, this has a lower cover of California sagebrush, higher cover of coyote brush, and numerous and co-dominant non-native species including castor bean (*Ricinus communis*), poison hemlock (*Conium maculatum*), black mustard (*Brassica nigra*), and pride of Madeira (*Echium candicans*).

Coastal bluff scrub (21.03 acres) occurs along hillslopes and cliffs on the southern side of the study area facing the ocean. Hill slopes in the southeastern portion are steep (vertical in places). Vegetation in this area is sparse and occurs mostly on a narrow terrace above high tide at the base of the cliffs. Common species include quailbush (*Atriplex lentiformis*), crystalline iceplant, croceum iceplant (*Malephora crocea*), bladder-pod, and Menzies's goldenbush (*Isocoma menziesii*) (CH2M Hill 2016a). Sensitive plants with potential to occur in this community include south coast saltscale (*Atriplex pacifica*; CRPR 1B.2), sticky dudleya (*Dudleya viscida*; CRPR 1B.2), and Pendleton button-celery (*Eryngium pendletonense*; CRPR 1B.1). Red sand verbena (*Abronia maritima*; CRPR 4.2), California box-thorn (*Lycium californicum*; CRPR 4.2), and woolly seablite (*Suaeda taxifolia*; CRPR 4.2) were detected within this habitat. Moderate to somewhat steep slopes along the western side of the study area are generally characterized by California sagebrush, bladder-pod, common deerweed, Menzies's goldenbush, and coastal prickly-pear (*Opuntia littoralis*), with locally dense areas of crystalline iceplant. Dense patches of quailbush, lemonade berry, and occasional laurel sumac are common along the lower edges of the slopes in the northwestern portion of the study area.

Grassland and Herbaceous Communities

Mixed grassland (14.09 acres), characterized by annual grasses, weedy forbs, native forbs, shrubs, and dense patches of crystalline iceplant, overlaps with mapped vernal pool habitat in the San Onofre Vernal Pool Restoration area (CH2M Hill 2016a). Common species include slender wild oat, soft chess (*Bromus hordeaceus*), rip-gut brome and red brome grasses, tocalote, fennel, Russian thistle (*Salsola tragus*), Menzies's goldenbush, California sage, and California buckwheat. Although not detected, sensitive species include intermediate mariposa lily (*Calochortus weedii* var. *intermedius*; CRPR 1B.2), long-spined spineflower (*Chorizanthe polygonoides var. longispina*; CRPR 1B.2), and Palmer's grappling hook (*Harpagonella palmeri*; CRPR 4.2).

Vernal Pools

Vernal pool habitat in the study area is adjacent to, but outside of, the Proposed Project disturbance limits (see Figure 4.4-2). Vegetation in vernal pool habitat (0.42 acre) is sparse and includes native wooly marbles (*Psilocarphus brevissimus*), and non-native

hyssop loosestrife (*Lythrum hyssopifolia*), Italian ryegrass (*Festuca perennis*), curly dock (*Rumex crispus*), and rabbitsfoot grass (*Polypogon monspeliensis*). Sensitive species include San Diego button-celery (*Eryngium aristulatum* var. *parishii*; SE, FE, CRPR 1B.1), Pendleton button-celery, vernal barley (*Hordeum intercedens*; CRPR 3.2), small-flowered microseris (*Microseris douglasii* ssp. *platycarpha*; CRPR 4.2), and little mousetail (*Myosurus minimus* ssp. *apus*; CRPR 3.1) (CH2M Hill 2016a). Coulter's goldfields (*Lasthenia glabrata* ssp. *Coulteri*; CRPR 1.B.1) and prostrate vernal pool navarretia (*Navarretia prostrata*; CRPR 1B.1) were recorded within 2 miles of the Proposed Project.

Ruderal/Disturbed

Ruderal and disturbed areas (4.55 acres) are characterized by non-native plant species such as hottentot-fig (*Carpobrotus edulis*), crystalline iceplant, and black mustard. Common associated species include red brome, Russian thistle, sour clover (*Melilotus indicus*), poison hemlock, tocalote, and castor bean. Native species such as deerweed, bladder-pod, telegraph weed (*Heterotheca grandiflora*), California sagebrush, and California buckwheat are sparsely distributed. Ruderal/disturbed vegetation was typically identified adjacent to, or surrounded by, developed areas (CH2M Hill 2016a).

Developed Beach

Developed beach (2.78 acres) includes San Onofre State Beach area in the northwestern portion of the study area, above the natural beach/intertidal area and below the coastal bluffs and cliffs. Development includes parking areas, restrooms, showers, and picnic areas. Coulter's saltbrush (*Atriplex coulteri*; CRPR 1B.2) was recorded at San Onofre State Beach campground, but most vegetation consists of planted California fan palms (*Washingtonia filifera*) and clumps of giant reed (*Arundo donax*) (CH2M Hill 2016a).

Developed

Developed areas (103.04 acres) in the terrestrial study area include SONGS buildings and infrastructure, parking lots, roads, trails, storage yards, an artificial basin, and concrete v-ditches for stormwater conveyance generated within the North Owner Controlled Area (NOCA) and Supplemental Support Areas (SSA) of the ~~o~~Onshore ~~s~~Site facilities. Vegetation associated with these areas includes various ornamental trees, shrubs, and perennials such as pine (*Pinus* sp.), eucalyptus (*Eucalyptus* spp.), honeysuckle (*Lonicera* sp.), and oleander (*Nerium oleander*) (CH2M Hill 2016a).

4.4.1.2 Terrestrial Wildlife

The SONGS facility is almost entirely paved and developed with parking lots, roads, and other disturbed areas (Figure 4.4-1). Ruderal and sage scrub communities along the beach and ornamental landscaping and eucalyptus trees along Basilone Road provide marginal foraging and breeding habitat for native wildlife. Noise and light from current

operations at SONGS also likely deter many native species from using the isolated patches of sage scrub north of the parking lot and east of Basilone Road.

Listed threatened and endangered terrestrial wildlife species with potential to occur onsite or nearby include San Diego fairy shrimp (*Branchinecta sandiegonensis*; FE), which were recorded in the San Onofre Vernal Pool Restoration Area in 2012, and Riverside fairy shrimp (*Streptocephalus woottoni*; FE (see Figure 4.4-2). Vernal pools typically hold water seasonally in the winter and spring and can provide habitat for fairy shrimp, which have adapted to the wet and dry season cycle (CH2M Hill 2016a). Although MCBCP lands are exempt from critical habitat designation requirements (the study area is within historic USFWS Critical Habitat for San Diego fairy shrimp), MCBCP coordinates with DPR and USFWS to enhance and restore the vernal pool habitat in this area and has closed the vernal pools to foot and vehicular traffic. The coastal California gnatcatcher (*Polioptila calfornica californica*; FT, SE) is also present on-site (see Figure 4.4 3) and is a small songbird that generally prefers open stands of coastal sage scrub in arid washes or on mesas and slopes. Coastal California gnatcatchers were documented as nesting in the SSA in the northern portion of the study area in 2014 (CH2M Hill 2016a).

The terrestrial study area contains marginally suitable habitat for shorebirds including the Western snowy plover (*Charadrius alexandrinus nivosus*; FT, SSC) and California least tern (*Sternula antillarum browni*; FE, SE, FP) due to the limited, rocky beach above the high tide line and high levels of human activity. These species are discussed below in Section 4.4.3.8, *Shorebirds and Seabirds*.

Other species with a moderate likelihood of occurrence (see Table F1-2 in Appendix F1) include western spadefoot (*Spea hammondii*; SSC), coast horned lizard (*Phrynosoma blainvillii; SSC*), Coronado Island skink (*Plestiodon skiltonianus interparietalis; SSC*), orange-throat whiptail (*Aspidoscelis hyperythra; SSC*), red-diamond rattlesnake (*Crotalus ruber; SSC*), burrowing owl (*Athene cunicularia; BCC, SSC*), Dulzura pocket mouse (*Chaetodipus californicus femoralis; SSC*), north-western San Diego pocket mouse (*Chaetodipus fallax fallax; SSC*), and San Diego desert woodrat (*Neotoma lepida intermedia; SSC*) (BonTerra 2012).

As summarized in Table F1-2 in Appendix F1, California brown pelican (*Pelecanus occidentalis californicus*) and American peregrine falcon (*Falco peregrinus anatum*), two other CDFW-designated FP bird species, have a low or moderate likelihood to forage or perch in the study area, as do 13 species designated as SSC. Three bat species, Pallid bat (*Antrozous pallidus*), western mastiff bat (*Eumops perotis californicus*), and pocketed free-tailed bat (*Nyctinomops femorosaccus*), likely forage over the area and may roost in human-made structures. Other listed threatened or endangered wildlife species known from the region but considered unlikely to occur due to a lack of suitable habitat include the southern California steelhead (*Oncorhynchus mykiss irideus*; FE), and tidewater goby (*Eucyclogobius newberryi*; FE, SSC), arroyo toad (*Anaxyrus californicus*; FE, SSC),

southwestern willow flycatcher (*Empidonax traillii extimus*; FE, SE), least Bell's vireo (*Vireo bellii pusillus*; FE, SE), Ridgway's rail (*Rallus obsoletuslevipes*; FE, SE), and Stephens' kangaroo rat (*Dipodomys stephensi*; FE, ST).

Wildlife species not listed above that have been observed or may occur in the study area include common species typical of developed areas adjacent to natural open space.

- Reptiles: southern alligator lizard (*Elgaria multicarinata*), western side-blotched lizard (*Uta stansburiana*), western fence lizard (*Sceloporus occidentalis*), gopher snake (*Pituophis catenifer*), and western rattlesnake (*Crotalus viridis*)
- Raptors and common avian species: Cooper's hawk (*Accipiter cooperii*), red-tailed hawk (*Buteo jamaicensis*), American kestrel (*Falco sparverius*), California gull (*Larus californicus*), western gull (*Larus occidentalis*), double-crested cormorant (*Phalacrocorax auritus*), killdeer (*Charadrius vociferous*), mourning dove (*Zenaida macroura*), black phoebe (*Sayornis nigricans*), western scrub-jay (*Aphelocoma californica*), bushtit (*Psaltriparus minimus*), common raven (*Corvus corax*), American crow (*Corvus brachyrhynchos*), Bewick's wren (*Thryomanes bewickii*), northern mockingbird (*Mimus polyglottos*), European starling (*Sturnus vulgaris*), house sparrow (*Passer domesticus*), spotted towhee (*Pipilo maculatus*), California towhee (*Melozone crissalis*), song sparrow (*Melospiza melodia*), house finch (*Carpodacus mexicanus*), and American goldfinch (*Spinus tristis*)
- Mammals: western harvest mouse (*Reithrodontomys megalotis*), California mouse (*Peromyscus californicus*), deer mouse (*Peromyscus maniculatus*), dusky-footed woodrat (*Neotoma fuscipes*), desert cottontail (*Sylvilagus audubonii*), California ground squirrel (*Spermophilus beecheyi*), striped skunk (*Mephitis mephitis*), and coyote (*Canis latrans*)

4.4.2 Environmental Setting (Marine)

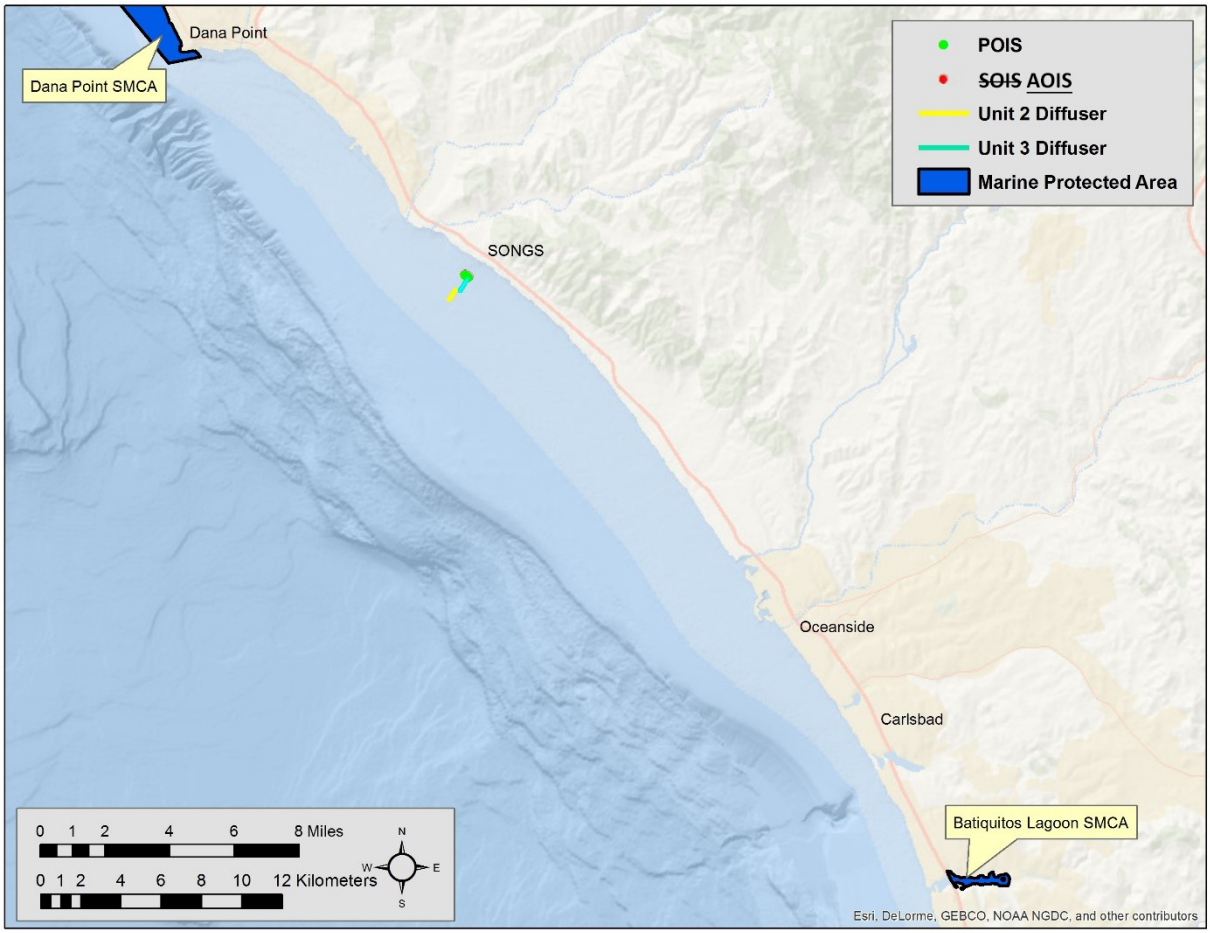
The proposed Project area is in the lower third of the Southern California Bight (SCB), which extends from Point Conception to the U.S.–Mexican border (Dailey et al. 1993). South of Point Conception, the narrow continental shelf expands to a broad continental borderland consisting of a series of islands, shallow banks, basins, canyons, and troughs extending 124 miles offshore. This dramatic change in bathymetry compared with the coastal environment north of Point Conception has an important regional effect on ocean currents and water circulation. The California Current is the dominant oceanographic current in the north eastern Pacific, driving cold, nutrient rich waters from the Bering Sea down the west coast of North America. As the California Current passes Point Conception it continues its trajectory toward the equator following the shelf edge while the coastline turns eastward and sweeps in an arch to the south. The California Current eventually turns inshore (east) between San Diego and Punta Colonet. As it approaches the shore, the California Counter Current diverges northward, creating a counter-clockwise gyre system that drives warmer, southerly waters upcoast along the coastline. The interaction

between this northward moving warm water and southward moving cold water creates a biogeographical transition zone in the SCB. Allen et al. (2006) refer to the cool-temperate ecology north of Point Conception as the Oregonian Province and the warm-temperate ecology of coastal Baja Mexico as the San Diegan Province.

The marine study area includes an area approximately 1,000 feet around the SONGS Units 2 and 3 intake and discharge conduits and about 1.7 miles of shoreline seaward of SONGS between the high and low tide lines, as well as ocean waters from Los Angeles to San Diego which include possible transit routes for Proposed Project-related work and support vessels. For a discussion of commercial and recreational fisheries that occur in the area, see Section 8.2. *Commercial Fishing*.

No Marine Protected Areas (MPAs) are in the Proposed Project area or would be affected by offshore decommissioning activities. The nearest MPAs are Dana Point State Marine Conservation Area (SMCA) and Batiquitos Lagoon SMCA, approximately 10.8 miles up-coast and 24 miles down-coast of SONGS, respectively (Figure 4.4-5).

Figure 4.4-5. Marine Protected Areas Closest to SONGS



Source: Marine Cadastre National Viewer 2018.

4.4.2.1 Benthic Habitat and Associated Species

Three distinct benthic habitats comprise the marine study area: (1) intertidal habitat overlying and near the buried SONGS intake/discharge conduits; (2) subtidal (submerged) habitats associated with soft sediment (sand and mud); and (3) subtidal habitats dominated by hard material (e.g., solid rock and boulder). The subtidal habitats are larger and include a greater diversity of habitats and biological communities and more complex ecosystems than the intertidal habitat.

Intertidal Habitat

As surveyed by CH2M Hill (2016a), intertidal habitat (24.23 acres) in the Proposed Project marine study area includes natural beach and intertidal habitat (21.59 acres) and developed beach habitat (2.64 acres), including Surfer's Beach. The area is primarily cobble with narrow strips of sandy beach to the northwest and southeast (CH2M Hill 2016a; MBC 2016b). The amount of sand and cobble habitat in the surveyed area changes seasonally, with sand cover generally building up in the spring and summer, then eroding away during the winter (J. Steinbeck pers. obs.). Yates et al. (2009) show that changes in sand levels are highly variable along the coast due to differences in beach topography, wave exposure, and alongshore currents. Based on modeling by Yates et al. (2009) of southern California beach elevation levels from 2004 to 2007, the early May survey of the intertidal habitat by CH2M Hill (2016a) occurred at a time of year when sand cover would be expected to be low, accounting for the abundance of cobble habitat.

The CH2M Hill (2016a) and MBC (2016b) survey results showed an intertidal community with low diversity. This low diversity is reflective of the dynamic nature of the intertidal habitat in the Proposed Project area, including the instability of the cobble substrate and the seasonal periods of sand scour affecting hard substrate in the area. Sand scour and other factors mentioned by Yates et al. (2009) contribute to the potential for disturbance and recovery of intertidal communities and the potential for cobble beach intertidal areas to support diverse assemblages of organisms (Foster et al. 1988; Murray and Bray 1993).

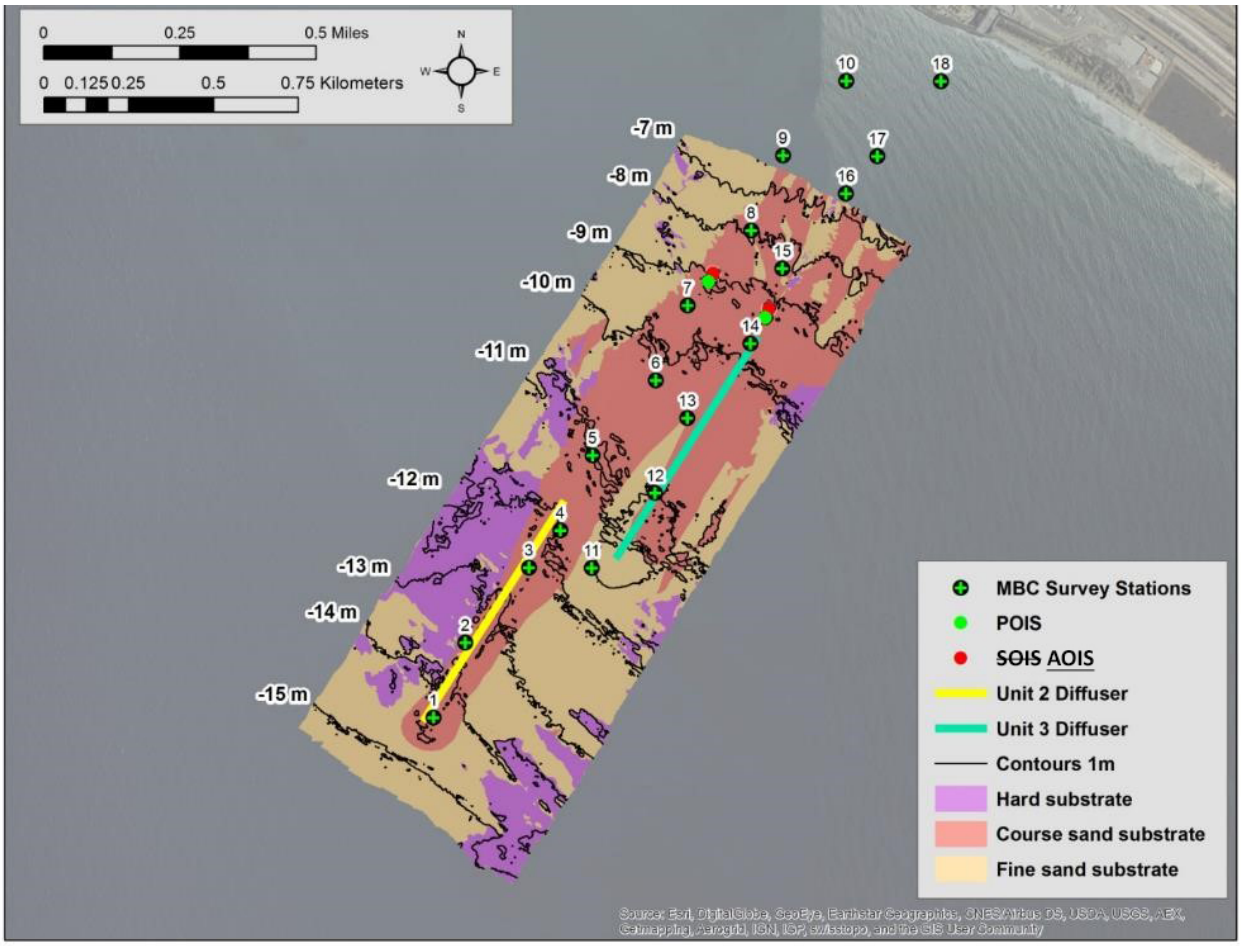
Another important habitat-forming component of the lower intertidal and shallow subtidal community is surfgrass (*Phyllospadix* spp.), which has rhizomatous root systems that tolerate sand accumulation (Littler et al. 1983) (see Section 4.4.3.2, *Surfgrass*). The absence of large coverage of macrophytes (aquatic plants) in the SONGS intertidal area increases the importance of alternative habitats such as beach wrack (organic material such as kelp and sea grass cast onto beaches by surf, tides, or wind), which may be common on nearby beaches due to the presence of nearshore kelp beds. According to Dugan et al. (2003), organisms associated with beach wrack (e.g., amphipods, isopods, and insects) may represent a large portion of the total abundance and diversity of organisms on many beaches; the abundance of two species of plovers was also positively correlated with the abundance of beach wrack, which can influence macrofaunal

(invertebrates living on or in sediment or attached to hard substrate) community structure, higher trophic levels, and ecological processes on sandy beaches.

Soft Subtidal Habitat

Data on substrate composition and bathymetry around the SONGS conduit corridors and adjacent seabed were collected using multibeam and side-scan sonar acoustic surveys (Coastal Environments, Inc. 2016), diver-collected sediment core samples at 18 stations along the conduit corridors (MBC 2016a), and diver surveys of habitat character around the diffuser array (MBC 2017a). Figure 4.4-6 shows the results of the acoustic surveys and the locations of the core samples. Additional photographs depicting the habitat at several diffuser ports on the Unit 2 and Unit 3 conduits can be found in Appendix F2.

Figure 4.4-6. Substrate Type within Offshore Intake Structure Survey Area



Source: Coastal Environments, Inc. 2016; MBC 2016a.
Acronyms: POIS = primary offshore intake structure; ~~S~~AOIS = ~~secondary~~auxillary offshore intake structure.
Note: The surveys did not include the very nearshore subtidal zone between the shoreline and 0.38 mile offshore, which are highly variable due to wave conditions and nearshore currents.

Coastal Environments, Inc. (2016) reported that 83 percent of the seabed it surveyed was soft substrate (sand ~~and mud~~ with silt and clay components). The conduit corridors were almost completely in coarse sand habitat. A finer grain sand area was documented at the end of the Unit 3 diffuser.

MBC (2016a) collected core samples in soft sediment along the conduit corridor to characterize infaunal species. Samples were processed for grain size and infaunal assemblage structure, and tested for a suite of chemical parameters that included potential pollutants. The 18 stations separated into two significantly different groups of species based on sediment grain size: Group 1 typically consisted of smaller grains, with a median grain size of less than (<) 0.01 inch; Group 2's median grain size was greater than or equal to (≥) 0.02 inch. The pattern of average grain size increased with distance offshore. This is contrary to the general distribution of sediment grain size along the coast where average grain size generally decreases with increasing depth (Koomans et al. 1998). Koomans et al. (1998) point out that differences in local hydrodynamic forces (e.g., waves and currents) can affect the pattern of grain size distribution.

Infaunal sampling by MBC (2016a) identified 8,061 organisms from 133 taxonomic groups. Infaunal communities are closely associated with sediment grain size (Bergen et al. 2001; Caeiro et al. 2005; Moreira et al. 2005) and this association may be more pronounced for some taxa, such as polychaetes (Diaz-Castaneda and Harris 2004). Depth is another factor associated with infaunal community assemblage structure (Caeiro et al. 2005; Smith et al. 2001). Of the 18 stations sampled, Station 11 was notable as an unusually deep site in the fine sediment group and the only site where polyaromatic hydrocarbon (PAH) levels were detected in the contaminant samples (the levels were well below the minimum reporting limit of 12 micrograms [µg] per kilogram [kg]).

Hard Subtidal Habitat

Approximately 17 percent of the seabed surveyed by Coastal Environments, Inc. (2016) consisted of hard substrate. This area corresponds to MBC (2016a) stations 1 through 4 surveyed later the same year, which indicated that the hard substrate in the area is primarily composed of large boulder and cobble (see Figure 4.4-6 above). Stations 1 through 4 were also the stations with the largest average grain size. Higher relief, hard substrate comes nearest to the SONGS conduits at the northwest end of the survey area along the Unit 2 diffuser. The MBC (2017a) divers confirmed that the Unit 2 diffuser array consisted of primarily sand and included scattered reef structure in the offshore and inshore sections of the array with extensive rocky rock reef in the middle part of the diffuser. Offshore Unit 3, Coastal Environments, Inc. (2016) identified one patch of hard habitat inshore of the Unit 3 Primary Offshore Intake Structure (POIS).

Habitat around Station 10, in transects surveyed by Coastal Environments, Inc. (2016) and MBC (2016a), consisted of an extensive boulder field. Although MBC (2016a) does

not identify sampling location depths, Station 10's location relative to the bathymetry in the Coastal Environments, Inc. (2016) report indicates it is in water shallower than 20 feet. The report does not provide information on the extent of the boulder field or whether the habitat extends onto the other stations (e.g., Stations 17 and 18) in the area. Communities of organisms were identified by MBC (2017) associated with the hard substrate provided by the diffuser ports (see Appendix F2). The diffuser ports provide a hard substrate on which red and brown algae and encrusting invertebrates can attach and establish communities. The diffuser ports and these attached organisms provide habitat for other invertebrates and fishes. However, because these organisms would not exist if it were not for the artificial structures, they have not been considered in the impact assessment as baseline resources.

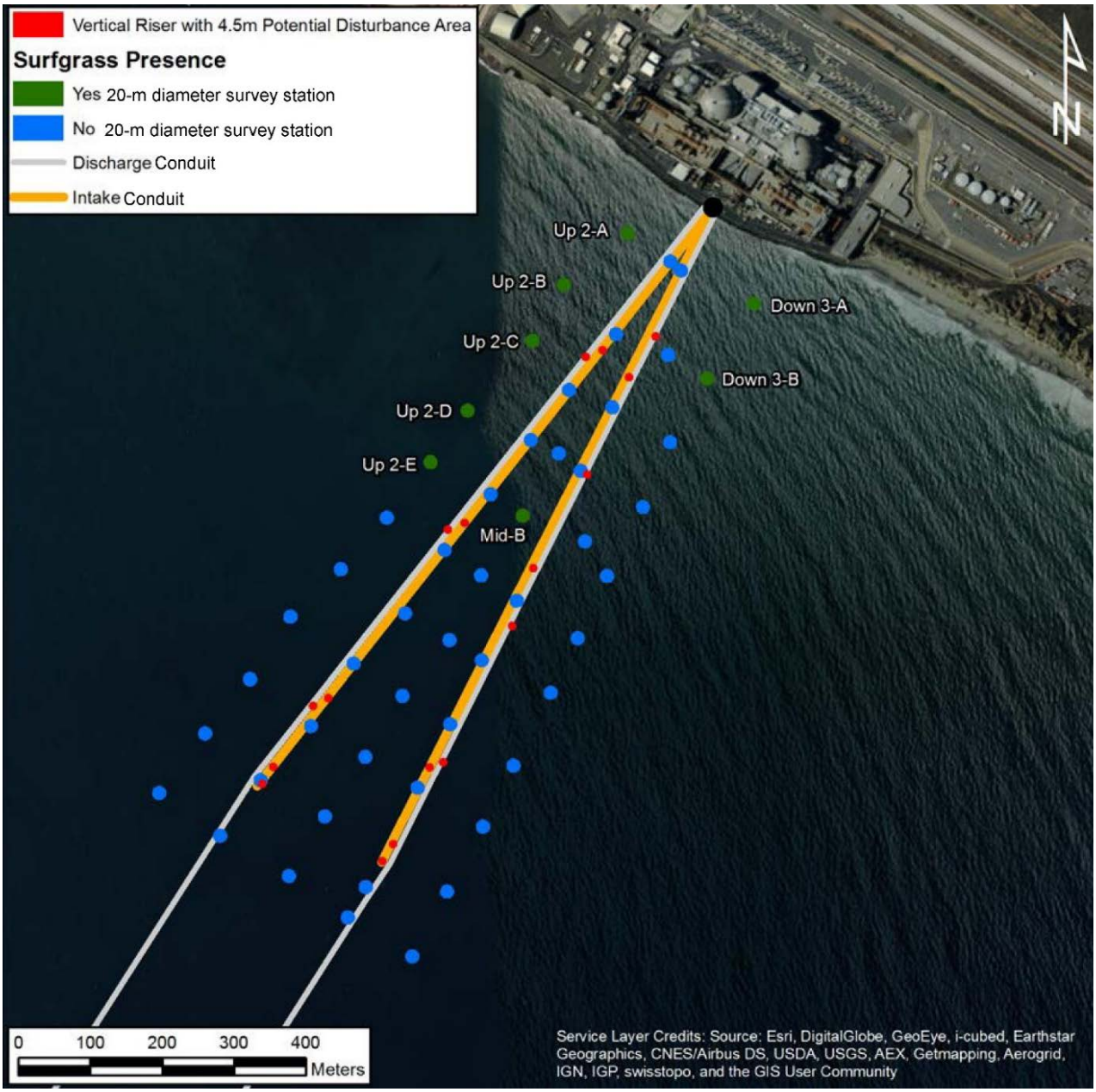
4.4.2.2 Surfgrass

The Pacific Groundfish FMP (PFMC 2016b) includes surfgrass as a Habitat of Particular Concern (HAPC) for a variety of fishes and macroinvertebrates. MBC (2016a, 2017b) identified surfgrass in the shallow subtidal zone inshore of the Units 2 and 3 intake structures in depths less than 23 feet between the shore and about 1,700 feet offshore. Figure 4.4-7 shows surfgrass up-coast of the Unit 2 conduits (MBC 2017b [stations 'Up 2-A' through 'E']) and at shallow stations down-coast of the Unit 3 conduits.

No surfgrass was observed at the Unit 3 POIS area. MBC (2017b) recorded surfgrass at only one off-site location, 1 mile down-coast of the Proposed Project area. Previous surveys in the late 1970s and early 1980s undertaken for the U.S. Minerals Management Service identified surfgrass in shoreline habitat adjacent to SONGS (Littler and Littler 1983). MBC (2003) observed surfgrass at four stations up-coast and adjacent to this area during SONGS Unit 1 pre-decommissioning, but not at other surveyed sites. The MBC (2003) report noted that the surfgrass was most likely *Phyllospadix torreyi*, which occurs in slightly deeper water in southern California and is more tolerant of areas with frequent sand inundation, a common occurrence in the Proposed Project area (Kozloff 2000).

MBC (2016a) does not provide detailed information on algae present in the survey area, although they note that the boulders observed at Station 10 provided habitat for red and brown understory algae. Figure 10 in MBC (2016a), a photo of the habitat at Station 10, shows a lush growth of *Stephanocystis osmundacea*, a brown algae characteristic of shallow water rocky habitats. The size of the boulders and lush algal growth in the photo indicate that the habitat may extend over a reasonably large area and is not limited to isolated boulders. Station 10 is considerably inshore of the San Onofre Kelp (SOK) forest, which is closest to the furthest offshore stations in this study (Stations 1 and 2).

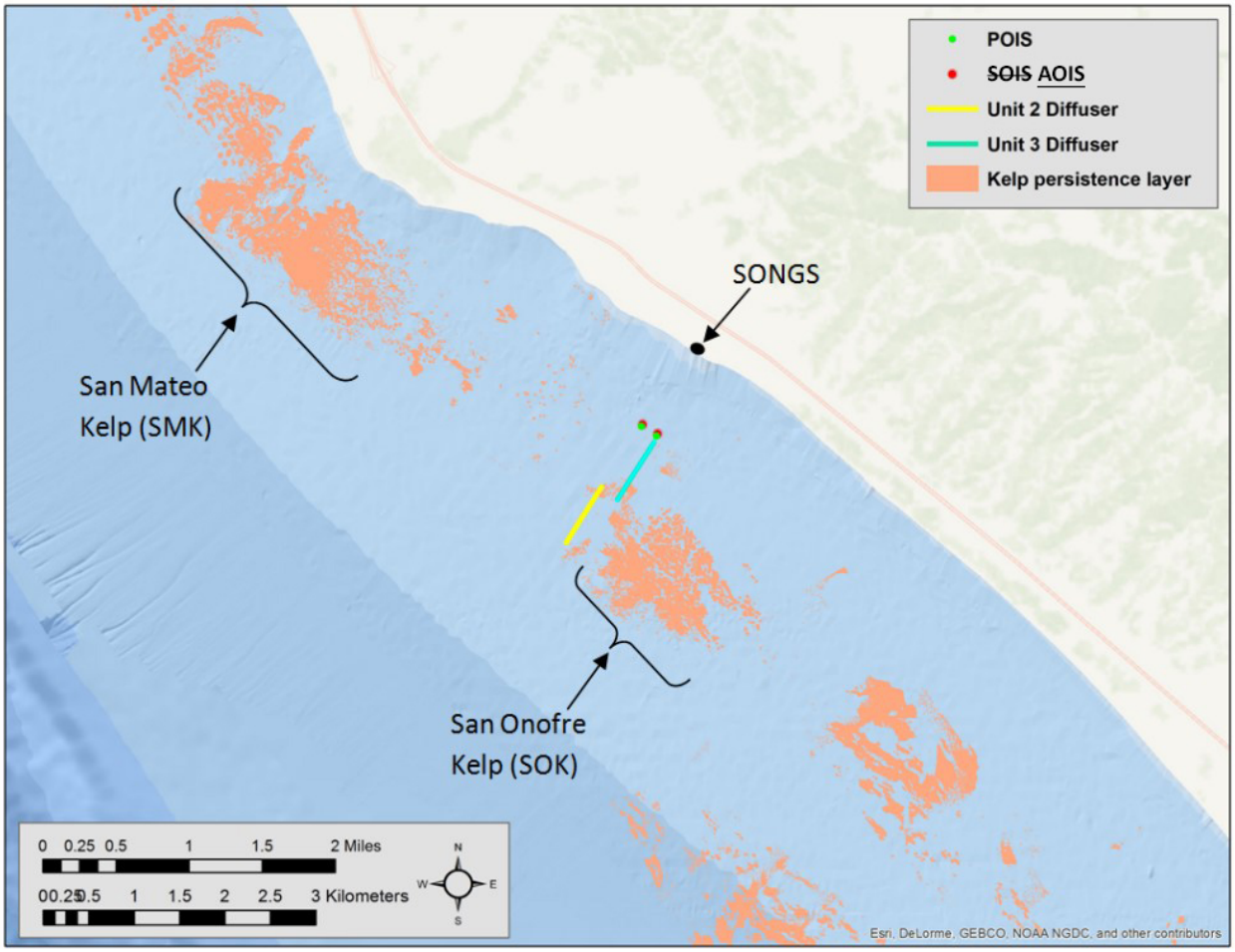
Figure 4.4-7. Surfgrass Survey Stations



Source: MBC 2017b.

Two giant kelp forests occur near SONGS: SOK forest, adjacent to the southeast of the end of the Unit 3 diffuser array; and San Mateo Kelp (SMK) forest, about 0.6 mile from the Unit 2 POIS (Figure 4.4-8). The Barn Kelp bed is approximately 9 miles down-coast of SONGS, well outside the Proposed Project's area of influence. The algal community consists of a giant kelp (*Macrocystis pyrifera*) canopy and an understory composed of the brown algae *Pterygophora californica*, *Cystoseira osmundacea*, *Laminaria farlowii,* and occasionally *Desmarestia ligulata*, and the red algae *Acrosorium uncinatum*.

Figure 4.4-8. Major, Persistent Kelp Beds Near SONGS



Source: MarineBIOS 2016.

Giant kelp grows on hard substrate, and SOK has higher sand coverage than SMK. Subsequently, giant kelp density at SMK has been greater than at SOK for much of the period 1978 through 2016 (SCE 2017f). This relationship has been less pronounced since 1995 compared to the period 1978 through 1988 when kelp density was much higher at SMK, even compared to SMK density from 1995 through 2016. No concurrent monitoring occurred between 1989 and 1995. Understory kelp (*Laminaria farlowii, Pterygophora californica, Cystoseira osmundacea*) and unidentified algal recruits are typically more abundant at SOK than SMK (SCE 2017f). Surveys of the SOK and SMK forests were completed in 2004 as part of a statewide baseline survey (Tenera 2006 – CRANE Study; the CRANE study used the Barn Kelp bed as a third reference site). Data from CRANE transects were used to characterize the SOK and SMK forest areas as having mostly flat relief (80 to 85%), with sand being the predominant substrate (60 to 78%), although cobble, boulder, and bedrock also occurred in each area.

The rocky substrate was colonized by crustose and erect coralline algae, red algal turf, erect foliose red algae, such as the *Rhodymenia* spp. observed by MBC (2012), and *Desmarestia*. Smaller kelp species grow only a few feet up from the substrate and form an understory or secondary canopy below the giant kelp surface canopy. Recorded understory kelp species included *Laminaria farlowii*, *Stephanocystis osmundacea*, *Eisenia arborea*, and *Pterygophora californica*. The CRANE study at the SOK and SMK forests in 2004 (Tenera 2006) also sampled subtidal fishes, macrophytes (algae and surfgrasses), and invertebrates; recorded organisms, especially the SOK bed, are likely representative of the hard bottom substrate in the Proposed Project area.

4.4.2.3 Plankton

Marine planktonic organisms are typically defined as passively transported organisms living within the water column, and they are distinguishable from nektonic organisms that actively move throughout the water column. Plankton can also be classified as holoplankton, which complete their entire life cycle as plankton, and meroplankton, which refers to the early life stages of other marine organisms that occur as plankton. Plankton consist of either phytoplankton that perform photosynthesis or zooplankton that graze on the phytoplankton or consume other zooplanktonic organisms. Plankton typically form the base of the food web in oceans. Plankton are also an important component in the carbon cycle, with phytoplankton capturing carbon dioxide through the process of photosynthesis and thereby contributing to the carbon balance by locking that carbon into the food web and transporting it to the deep oceans as they die and sink.

Phytoplankton are typically very small. More than half of the phytoplankton biomass in Santa Monica basin passes through a 5 micrometer (µm) sieve (Hardy 1993). Many species of phytoplankton occur within the SCB and, as in other areas, their abundance and distribution is highly variable spatially and over time. Diatoms and dinoflagellates compose the largest groups of phytoplankton, and coccolithophores, euglenoids, and ciliates make up sizeable proportions of the remaining biomass. The occurrence of species within the marine study area is related to the incursion of bodies of water from the warm or cold temperate regimes that border the SCB. Residence time of water can be locally important in determining species assemblage in phytoplankton (Hardy 1993).

Like phytoplankton, zooplankton are also highly variable in their abundance, composition, and distribution across space and time. Variations in the rate of flow of the California Current that occur on 3- to 5-year timescales was correlated with changes in zooplankton in the SCB (Dawson and Pieper 1993). Seasonal and locational variation also occurs in zooplankton within the SCB driven by coastal upwelling, eddies, plumes, tidal variation, diel processes, wind stress, and many other physical forcing mechanisms (Dawson and Pieper 1993; DiGiacomo and Holt 2001; Selkoe et al. 2006). Microzooplankton (less than 250 µm) constitute an important part of the consumer zooplankton (Azam et al. 1983; Cho

and Azam 1988; Dawson and Pieper 1993). They are composed primarily of protozoans and juvenile stages of many invertebrate species such as copepods and copepodites.

Protozoans are capable of asexual reproduction and so are able to quickly respond to blooms of phytoplankton (Dawson and Pieper 1993). The microzooplankton composes approximately 20 to 25 percent of the food source for macrozooplankton, including larval forms of fishes and invertebrates (Dawson and Pieper 1993). Macrozooplankton are a diverse group of organisms loosely grouped on the basis that they are typically larger than 250 to 300 µm. Many of the macrozooplankton are crustaceans, and the most abundant of these are typically copepods (Dawson and Pieper 1993). Many planktonic copepods are calanoids, including members of the genus *Acartia*, *Paracalanus*, *Labidocera*, and *Calanus*. Cladocerans and ostracods are also abundant crustacean macrozooplankton. Gelatinous zooplankton include medusa, ctenophores, and planktonic mollusks and tunicates. Arrow worms (Chaetognaths) are a common predator in the macrozooplankton community (Dawson and Pieper 1993).

4.4.2.4 Invertebrates

MBC (2016a) conducted a subtidal survey of the Proposed Project area and identified several species of epifaunal (living on the surface of the seabed) invertebrates, one of which, Pacific sand dollar (*Dendraster excentricus*), occurs only in sandy habitat and is an abundant macroorganism off many Pacific Coast beaches. Pacific sand dollar was the most abundant invertebrate species observed in the study area, ranging from 0.5 to 5 individuals per 108 feet squared on the four 164-foot-long transects. According to Merrill and Hobson (1970), organisms that associate with sand dollar beds include fouling organisms such as the barnacle (*Balanus pacificus*), which will grow on sand dollars. Other species included crowned sea urchin (*Centrostephanus coronatus*), California spiny lobster (*Panulirus interruptus*), red sea urchin (*Strongylocentrotus franciscanus*), purple sea urchin (*Strongylocentrotus purpuratus*), and Kellet's whelk (*Kelletia keletii*). Common macro-invertebrates associated with the SOK and SMK beds include red and white sea urchins, gorgonian corals, and a variety of mollusks (Murdoch et al. 1989).

Intertidal surveys by CH2M Hill (2016a) and MBC (2016b) showed an intertidal community with low diversity, with more abundant and diverse invertebrate species present down-coast of the Proposed Project site than up-coast. Dominant invertebrates in the down-coast transects TA3, TA4 and TA5 (see MBC [2016b]) included mussels (*Mytilus galloprovincialis*), limpets (*Lottia spp.* including *L. digitalis*), barnacles (*Pollicipes polymeruss* and *Chthamalus fissus*), and the shore crab (*Pachygrapsus crassipes*); only a small gastropod mollusk (*Alia carinata*) and Pacific sand crab (*Emerita analoga*) were noted in the up-coast transects TA1 and TA2. CH2M Hill (2016a) observed only nine invertebrates and one fish (a deceased round stingray [*Urobatis halleri*] not normally considered a component of the intertidal fish community).

The CRANE sampling in 2004 (Tenera 2006) also recorded three species of sea star (*Pisaster ochraceus*, *Pisaster giganteus*, and *Patiria miniata*), sea cucumber (*Parastichopus parvimensis*), wavy turban shell (*Lithopoma undosa*), sponges (Porifera), hydroids (Hydroida), tunicates (Tunicata), bryozoans (Bryozoa), barnacles (Cirripedia), tube worms (*Phragmataopma*, *Chaetopterus*, and *Diopatra*), cup corals (*Balanophyllia*, *Paracyathus*, and *Astrangia*), and gorgonians (Gorgoniacea) growing attached to hard substrate. A juvenile abalone (*Haliotis* spp.), not identified to species, was found at SMK.

Of seven species of abalone in California, green (*Haliotis fulgens*) and pink (*Haliotis corrugata*) abalone may occur near the Proposed Project area. In southern California, green abalone are found from the low intertidal to about 33 feet water depth, while pink abalone are more commonly found in depths of 20 to 196 feet (Morris et al. 1980). The shells of a white and threaded abalone were reportedly found within the San Onofre Kelp bed by Jeff Crumley (Crumley 2018) indicating that there is potential for either of these species to occur in the area. White abalone (*H. sorenseni*) are among the deepest occurring abalone species in California. While white abalone may occur as shallow as 15 feet, the main depth range for this species is 80 to 100 feet (Stierhoff et al. 2012). The maximum depth of Proposed Project activities likely to affect white abalone is approximately 50 feet, which is shallower than the preferred depth for this rare species. Therefore, it is unlikely that white abalone would be affected by Proposed Project activities. Threaded abalone (*H. kamtschatkana assimilis*) is a southerly morphological variant of pinto abalone (*Haliotis kamtschatkana*) (Supernault et al. 2010). These abalone occur in depths from 20 to 80 feet, which corresponds within the depth range of Proposed Project activities; therefore, threaded abalone may occur in the Proposed Project area. Black abalone are an intertidal to low subtidal abalone species, occurring on rocky bench habitat in the nearshore. As there is no rocky bench intertidal habitat within the area of Proposed Project activities, this species is unlikely to occur.

Two species, black abalone (*Haliotis cracerodii*) and white abalone (*Haliotis sorenseni*), are listed as endangered species under the FESA; however, the Proposed Project area is not included in the critical habitat listing for black abalone (76 FR No. 66806, 27 October 2011) and no critical habitat has been designated for white abalone (NMFS 2008). ~~Both of these species~~As noted above, black abalone are highly unlikely to occur in the Project area owing to a lack of suitable habitat~~.~~, and impacts to white abalone are unlikely to occur, due to the shallower depth of Proposed Project activities (maximum 50 feet) relative to the reported depth range for white abalone (80 to 100 feet). The CDFW has developed an Abalone Recovery and Management Plan for the recovery of all the species of abalone in the state (CDFW 2005).

4.4.2.5 Fishes

Data on fish abundance comes from several studies, including a SCUBA study over the two conduit corridors in May and June 2016, where divers observed 45 individual fishes

when surveying a 0.9-acre spread (MBC 2016a). Most fishes (69% and ~~31~~ 8 taxa) were observed at just two of the 18 sample sites. These two sites were not close to one another relative to the other sites surveyed. One site was about 0.3 mile from the end of the Unit 2 conduit and the other was about 0.25 mile from shore. The following subsections discuss fishes in the marine study area based on their association with soft or hard subtidal habitat or as wide-ranging pelagic-associated species.

The SONGS Units 2 and 3 intakes are located within predominantly soft subtidal habitat. The composition of fishes sampled in nearby dive and trawl surveys or impinged by the intakes reflects the species associated with this habitat locally, as well as the more abundant fish species associated with pelagic habitat.[36] Kelp bass (*Paralabrax clathratus*) and barred sand bass (*Paralabrax nebulifer*) were the most commonly observed fish during the most recent dive surveys near SONGS (MBC 2016a). The most abundant fishes associated with soft sediment habitats observed in SONGS impingement data were queenfish (*Seriphus politus*), white seaperch, white croaker (*Genyonemus lineatus*), and yellowfin croaker (*Umbrina roncador*). Salema (*Xenistius californiensis*) were also collected in high numbers in the Fish Return Device (SCE 2008). ENERCON (2014) indicated a similar fish assemblage to the impingement data in its summary of trawl data collected near SONGS Units 2 and 3 dating as far back as 1979. Summary data in MBC (2012) lists walleye surfperch (*Hyperprosopon argenteum*) alongside the species listed above as frequently occurring in trawl samples collected from 2000 through 2010. Fishes associated with soft sediment habitats also include many flatfishes such as speckled sanddab (*Citharychthys stigmaeus*), diamond turbot (*Pleuronichthys guttulatus*), and California halibut (*Paralychthys californicus*).

Nearshore subtidal rocky reefs and associated kelp beds provide habitat for a variety of fishes. The vertical structure of the habitat with rocky outcroppings and algae on the bottom, foliose algae and bottom canopy kelps such as *Eisenia* and *Laminaria* up to a few feet off the bottom, and giant kelp in the water column and on the surface, provide a diversity of habitats for fishes. The surveys of the Proposed Project area by MBC (2016a) identified 12 species of fish from the Proposed Project area, but some of these, such as the California lizardfish (*Synodus lucioceps*), were most likely observed in the sandy areas surveyed. As noted above, the most abundant species recorded by MBC (2016a) was kelp bass, which was recorded in four of their sampling areas. Other common species seen in the water column at the two large kelp beds in the area, SOK and SMK, were kelp perch (*Brachyistus frenatus*), senorita (*Oxyiulis californica*), halfmoon (*Medialuna californianis*), and white seaperch (*Phanerodon furcatus*). Common species of fishes associated with the bottom substrate within both kelp forests were senorita (*Oxyjulis californica*), kelp bass, California sheephead (*Semicossyphus pulcher*), white seaperch

[36] Data on juvenile and adult fishes drawn into the SONGS intake conduits have been collected at Unit 2 since 1982 and at Unit 3 since 1983 as required by the SONGS National Pollutant Discharge Elimination System permit. Since 2005, these surveys were conducted for one 24-hour period per quarter each year. Impingement data were collected bi-weekly from 2006 through 2007 (SCE 2008).

(*Phanerod furcantus*), black perch (*Embiotoca jacksoni*), rock wrasse (*Halichoeres semicinctus*), pile perch (*Rhacochilus vacca*), blacksmith (*Chromis punctipinnis*), black croaker (*Cheilotrema saturnum*), and barred sand bass (Murdoch et al. 1989).

Tenera (2006) recorded nine species from the SMK bed, and 14 from the SOK bed closest to the area surveyed by MBC (2016a). The most abundant species were senorita and jack mackerel (*Trachurus symmetricus*), which were recorded from the sampling through the water column above the bottom. The reported limited visibility during the MBC (2016a) survey may have affected the ability of the divers to survey water column areas above the seafloor. Garibaldi (*Hypsypops rubicundus*), a species common in all types of rocky reef habitat in southern California, were observed at one station in the survey.

Species commonly associated with pelagic habitat include northern anchovy (*Engraulis mordax*), Pacific sardine (*Sardinops sagax*), deepbody anchovy (*Anchoa compressa*), and topsmelt (*Atherinops affinis*). Northern anchovy and Pacific sardine are both pelagic (open sea) schooling fishes. Both species are managed by FMPs and are characterized below under *Essential Fish Habitat Summary*. Therefore, they are not discussed in further detail in this subsection. Topsmelt is a common nearshore pelagic schooling fish also found commonly in bays and estuaries. They achieve this wide habitat range by being generalist feeders, capitalizing on both zooplankton in the water column (typical to many pelagic schooling species) as well as benthic prey in kelp beds and macroalgae and detritus in estuaries and bays (Horn and Ferry-Graham 2006).

Most marine fishes occurring in the marine study area have a pelagic larval stage and many of these also have a pelagic egg stage prior to hatching of the larvae. Eggs and larvae are typically highest in spring. An exception is seabass that peak in summer. Pelagic larval fishes and fish eggs do not typically have benthic habitat associations, at least not until late stage development when their habitat associations begin to resemble that of juvenile and adult stages (described above). The most recent data on fish larvae in the Proposed Project area were collected in 2006 to 2007 (SCE 2008; see also MEC 1987). The most abundant larval fishes observed in these surveys are anchovies, queenfish, clinid kelpfishes, combtooth blennies, gobies and white croaker. These taxa comprised 84 percent of the larvae collected in ichthyoplankton surveys at SONGS (SCE 2008). These species, which are also common to the habitats occurring in the Proposed Project area as adults, produce many more offspring than other local species.

Essential Fish Habitat Summary

At least 27 fish species identified in one or more of the four regional FMPs are likely to occur in the Proposed Project area (see Table 4.4-2 and Table F1-6 in Appendix F).

Table 4.4-2. EFH Fishes with High Likelihood of Occurrence

Taxa in Area[1]	Fishery Management Plan			
	HMS	PCG	CPS	PCSP
~~**Nearshore – Benthic**~~				
~~Ratfish (*Hydrolagus colliei*)~~		~~x~~		
Nearshore Benthic – Soft Substrate				
Curlfin sole (*Pleuronichthys decurrens*)		x		
English sole (*Parophrys vetulus*)		x		
Pacific sanddab (*Citharichthys sordidus*)		x		
Sand sole (*Psettichthys melanostictus*)		x		
Starry flounder (*Platichthys stellatus*)		x		
Big skate (*Raja binoculata*)		x		
California skate (*Raja inornata*)		x		
Other skates (endemic species in family Arhynchobatidae)		x		
Nearshore Benthic – Hard Substrate				
Cabezon (*Scorpaenichthys marmoratus*)		x		
Rockfishes (*Sebastes* spp.)		x		
Lingcod (*Ophiodon elongates*)		x		
Nearshore – Benthic and Pelagic				
Leopard shark (*Triakis semifasciata*)		x		
Spiny dogfish (*Squalus suckleyi*)		x		
Smelts (Osmeridae)		x	x	
Nearshore – Pelagic/Water Column				
Pacific sardine (*Sardinops sagax*)			x	
Pacific (chub) mackerel (*Scomber japonicas*)			x	
Northern anchovy (*Engraulis mordax*)			x	
Jack mackerel (*Trachurus symmetricus*)			x	
Jacksmelt (*Atherinopsis californiensis*)			x	
Market squid (*Doryteuthis opalescens*)			x	
Silversides (Atherinopsidae)		x	x	
Pacific whiting (hake) (*Merluccius productus*)		x		
~~Sablefish (*Anoplopoma fimbria*)~~		~~x~~		
Round herring (*Etrumeus teres*)	x	x	x	x
Mesopelagic fishes Families: Myctophidae, Bathylagidae, Paralepididae, and Gonostomatidae	x	x	x	x
Great white shark (*Carcharodon carcharias*)	x			
Common thresher shark (*Alopias vulpinus*)	x			
Soupfin shark (*Galeorhinus zyopterus*)		x		

Sources: PFMC 2016a, b, c, and d; Love 2011; Miller and Lea 1972; Allen 2006; MBC 2007.
Acronyms: CPS = Coastal Pelagic Specie; FMP = Fishery Management Plan; HMS = Highly Migratory Species; PCG = Pacific Coast Groundfish; PCS = Pacific Coast Salmon.
Notes: [1] Likelihood of occurrence is relative to the taxa population distribution.

4.4.2.6 Sea Turtles

Based on their natural distribution, four species of sea turtle, all protected under the FESA, may occur in the Proposed Project area – green (*Chelonia mydas*), loggerhead (*Caretta caretta*), leatherback (*Dermochelys coriacea*), and olive ridley (*Lepidochelys*

olivacea). From 2006 through 2011, nine green turtles, one loggerhead sea turtle, and one olive ridley sea turtle were entrapped in the SONGS Units 2 and 3 once-through cooling water system (MBC 2012). Olive ridley, green, and loggerhead sea turtles are tropical residents of the eastern Pacific, but move into temperate waters, particularly during the summer months. A population of green turtles was observed in the warm water discharge of the San Diego Bay power plant and feeding within the eelgrass beds (Benson and Dutton 2012; Dutton and McDonald 1991). The nearest recorded nesting sites are found along the coast of Mexico (Benson and Dutton 2012). Leatherback turtles migrate for 10 to 12 months from nesting areas in the western and central Pacific to reach coastal waters on the eastern Pacific, including southern California where they feed.

4.4.2.7 Shorebirds and Seabirds

Almost 200 species of marine birds are associated with coastal or offshore aquatic habitats in the SCB (Baird 1993). Baird (1993) classifies the species by habitat into four groups: marshbirds (e.g., herons, rails, and egrets), waterbirds (e.g., ducks, geese, coots, and grebes), shorebirds (e.g., plovers and sandpipers), and seabirds (e.g., gulls, cormorants, and terns). This section focuses on shorebirds and seabirds, which have the most potential for being impacted during the Proposed Project. The closest wetland habitat to the Proposed Project that would support marshbirds and waterbirds is the outlet of San Mateo Creek, located approximately 1 mile north of the Proposed Project site. The shorebirds and seabirds listed in the CNDDB Special Animals list that are likely to occur in the Proposed Project area are shown in Table F1-4 in Appendix F1.

The terrestrial study area contains marginally suitable habitat for the federal- and state-listed Western snowy plover due to the limited, rocky beach above the high tide line and high levels of human activity. Western snowy plovers breed from March through September. Their preferred habitat is wide sandy beaches above the high tide line (Baird 1993), which do not occur in the Proposed Project area. Data from a recent breeding survey for snowy plover show that no plovers were observed in surveys in the San Onofre area from 2005 through 2016 (USFWS 2016b). Large numbers of birds were observed to the south along MCBCP over the same period. The most recent review of critical habitat for the species has exempted the area south of the plant including San Onofre State Beach and MCBCP from the critical habitat designation due to ongoing conservation measures for the species implemented by both DPR and MCBCP (USFWS 2012). The absence of large expanses of sandy beach habitat in the direct vicinity of the Proposed Project area should limit any effects on western snowy plover.

Other shorebirds that could occur in the Proposed Project area included on the Special Animals list (Table F1-4) are black oystercatcher (*Haematopus bachmani*) and the long-billed curlew (*Numenius americanus*). Both are listed by the USFWS as a Bird of Conservation Concern, and the long-billed curlew is also included on the CDFW watch list. The shoreline habitat in the direct vicinity of the Proposed Project is not the primary

habitat for either of these species, and the abundance of black oystercatcher in southern California is low compared to northern and central California where there are larger amounts of rock habitat associated with this species.

While western snowy plover and black oystercatcher can occur year-round, most other shorebirds in the SCB occur in highest abundances during the winter months and may occur in other habitats, such as the long-billed curlew which frequents agricultural fields (Baird 1993). The low abundance of western snowy plover and black oystercatcher along southern California beaches is supported by data in Dugan et al. (2015), which showed these two species to be in relatively low abundance compared to other species. The most abundant shorebirds observed in the extensive baseline surveys in Dugan et al. (2015) were sanderling (*Calidris alba*), black-bellied plover (*Pluvialis squatarola*), whimbrel (*Numenius phaeopus*), western sandpiper (*Calidris mauri*), and marbled godwit (*Limosa fedoa*). Most of these and the other species identified in the report feed along the shore and in shallow water on insects and crustaceans, especially the Pacific sand crab.

The California least tern, another federally- and state-listed species, was observed feeding in kelp beds offshore SONGS and breeding from April through September on sandy beach habitat within MCBCP more than 7 miles south of the Proposed Project area; the largest concentrations occurring on MCBCP have been recorded near the Santa Margarita River (USFWS 2006). This information was supported by data collected during the 2015 breeding season survey which showed that MCBCP had the largest numbers of breeding pairs in the state (Frost 2016). The absence of wide sandy beach areas in the direct vicinity of the Proposed Project should limit any impacts on this species.

Other seabirds identified on the CNDDB list of “Special Animals” (Table F1-4) that could be affected by the Proposed Project include species that may forage on the shoreline such as the California gull and species that generally occur further offshore such as the ashy storm-petrel (*Oceanodroma homochroa)* and black storm-petrel (*Oceanodroma melania)*. For example, Dugan et al. (2015) found that six species of gulls were almost as abundant as the 24 species of shoreline species observed during the surveys. The most abundant species of gulls observed during the surveys were western gull (27 percent), Heerman’s gull (*Larus heermanni*; 8.3 percent), California gull (5.7 percent), and herring gull (*Larus argentatus*; 4.5 percent). These and other seabirds observed during the surveys are typically associated with foraging relatively close to shore. Based on average abundance observed over the study, the most abundant seabirds were western grebe (*Aechmophorus occidentalis*; 41 percent), double-crested cormorants (23.1 percent), royal terns (*Thalasseus maximus*; 12.7 percent), and brown pelicans (11.6 percent).

4.4.2.8 Marine Mammals

Historical data on marine mammal abundance near SONGS were summarized for surveys from 2007 through 2011 by MBC (2012). Over 78 percent of marine mammal observations occurred during winter and spring months; few animals were observed in

summer. Commonly observed species were short-beaked common dolphin (*Delphinus delphus*), which constituted 77 percent of the total number of observations over the 5 years of surveys, followed by California sea lion (*Zalophus californianus californianus*), bottlenose dolphin (*Tursiops truncates*) and Risso's dolphin (*Grampus griseus*). Other observed species with a moderate likelihood of occurrence in the Proposed Project area are gray whale (*Eschrichtius robustus*), which may occur in nearshore coastal waters during migratory periods, long-beaked (*Delphinus capensis*), and harbor seal (*Phoca vitulina*) (MBC 2012). Some of the identified species could also be encountered during vessel transits between the Proposed Project area and harbors.

None of the species likely to occur within the marine study area is listed as threatened or endangered. The expected presence of the following special status marine mammals (see also Table F1-3 in Appendix F1) is either low, given their respective population densities and habitat preferences, or unlikely, given their known inhabited ranges or because suitable habitat is absent in the Proposed Project area (CDFW 2017b; Tinker and Hatfield 2016; NMFS 2018a-l).

- **Low** – blue whale (*Balaenoptera musculus*; FE); fin whale (*Balaenoptera physalus*; FE); sei whale (*Balaenoptera borealis*; FE); humpback whale (*Megaptera novaeangliae*; FE); and sperm whale (*Physeter macrocephalus*; FE)
- **Unlikely** – southern sea otter (*Enhydra lutris nereis*; FT, FP) and Guadalupe fur seal (*Arctocephalus townsendii*; FT, ST, FP)

Common Dolphin

Two species of common dolphin, short-beaked (*Delphinus delphis*) and long-beaked (*Delphinus capensis*), occur in the Project area, with short-beaked common dolphins, which account for more than 50 percent of sightings by researchers throughout California, common out to 300 nautical miles (nm). The life history of short-beaked common dolphins is described in Allen et al. (2011) and NMFS (2011a). Births peak in June through September, although there is evidence of calving peaks from March through May and August through October as well. Calves nurse for 6 months with their mothers and are capable of eating other food at 2 to 3 months of age. Feeding typically occurs at night, and the large groups that congregate during the daytime tend to be for socializing and rest. Like many delphinids, common dolphins communicate with an extensive repertoire of sounds. Normal travel speeds for short-beaked common dolphin are 6 miles per hour (mph), although they can reach speeds of 17 to 22 mph.

Long-beaked common dolphins (*Delphinus capensis*) are similar in appearance and distribution within the Project area and were identified as a separate species in the 1990s. Their distribution overlaps those of the short-beaked common dolphin in the Project area and their ecology is very similar to this species. Regionally, long-beaked common dolphins have a smaller range than short-beaked common dolphins. They are typically

restricted to within about 50 nm of the coast from Baja California northward to about central California. Less than 15 percent of sightings of long-beaked common dolphins occur in waters deeper than 1,640 feet (NMFS 2017).

Bottlenose Dolphin

Bottlenose dolphin populations in California are genetically differentiated as a nearshore and an offshore population. Nearshore bottlenose dolphins occur within 0.6 mile of shore. In southern California, this population occurs within 0.3 mile of shore 99 percent of the time and within 820 feet of shore 90 percent of the time. Population stock estimates for the nearshore stock indicate a population of around 450 to 500 individuals, and the population appears to have remained stable over the last 20 years. Results of studies indicate that individuals are highly mobile. Over 80 percent of tagged individuals identified in Santa Barbara, Monterey, and Ensenada, Mexico have also been observed near San Diego (NMFS 2008). The eastern Pacific offshore population is rarely observed and not well described (Allen et al. 2011); thus, the offshore extent of the population is unknown.

Risso's Dolphin

Risso's dolphins are commonly seen throughout the U.S. Pacific Coast in California, Washington, and Oregon. Typically, populations shift north after the colder winter months as water temperatures increase in the late spring and summer. The most recent stock assessment of the California, Washington, and Oregon population estimated the population at around 6,300 individuals. However, interannual variability is likely to be quite high and surveys have provided estimates between 4,000 and 11,000 individuals annually from 1991 through 2008 (NMFS 2011b).

California Sea Lion

California sea lions range from Alaska to Mexico; however, the core breeding range centers on the Channel Islands in southern California, particularly San Miguel and San Nicholas islands (NMFS 2015a). Smaller breeding areas occur in western Baja California. Population estimates from NMFS stock assessment (NMFS 2015a) based on pup surveys in 2008 place the population size at around 300,000 individuals. They are coastal animals that typically range no further than 20 nm from shore. After breeding, males typically migrate north while females and young range much closer to breeding grounds (Allen et al. 2011). Five genetically distinct populations of California sea lion have been identified (Schramm et al. 2009) of which one, the Pacific temperate group, is most likely to constitute the majority of the individuals observed in the Proposed Project area.

Harbor Seal

The subspecies of harbor seal *Phoca vitulina richardii* inhabits the eastern north Pacific from Mexico to Alaska. Of the four genetically differentiated stocks; the California

population is estimated at 31,000 individuals (NMFS 2015b). During breeding and molting seasons (around March in Southern California) harbor seals spend a considerable amount of time on the shore at haul-out locations. Lowry et al. (2008), as referenced in NFMS (2015b), recorded no seals at haul-out sites along the coast between Encinitas and Dana Point, which includes the proposed Project area. Harbor seals mostly forage at night and rest during the day. They are typically curious in nature and will come close to boats and divers. Surface observations of harbor seals are often of the animals resting in a vertical position with their head above the water, often within kelp canopy areas. Harbor seals typically forage close to shore and dives are frequently shallow (less than 16 feet).

Gray Whale

The gray whale, which has been observed in the Proposed Project area during its south or north migrations, is the most likely whale species to be present in the area during the proposed offshore decommissioning activities. This species was removed from the endangered species list in June 1994. Within the north Pacific Ocean, a small western Pacific population exists, with occasional individuals observed intermixing with the distribution of the eastern north Pacific (ENP) group. However, the ENP group represents the largest remaining genetically distinct population of gray whales globally. The ENP population is estimated to be 20,990 individuals based on 2010/2011 southbound survey data. Most ENP gray whales migrate from feeding grounds between Alaska and Russia (Chukchi, Beaufort, and northwestern Bering Seas), with a small number feeding in waters between Alaska and northern California. There is ongoing debate as to whether these individuals constitute a genetically distinct population and should be federally managed as a distinct stock. These whales migrate to wintering lagoons in Baja California where pregnant females calve, typically in distinct lagoons within the region (NMFS 2015c). During migrations, gray whales stay within 6 nm of shore unless navigating around islands. Cow-calf pairs are most often observed heading north in May, although they can be observed as early as March and as late as June.

4.4.2.9 Invasive and Non-Native Marine Species

Limited data exist on the presence of invasive or non-native species in the Proposed Project area. Introduced species are of concern because of their potential effects on the ecosystem, including displacement of native species and the danger of carrying disease. In the absence of their natural predators, these species have the potential to increase in abundance to levels that impact terrestrial and marine habitats and commercial or recreational activities by clogging waterways and impacting navigation and recreation. For example, the green algae, *Caulerpa taxifolia*, was believed to have been released from an aquarium directly into Agua Hedionda Lagoon, south of SONGS, where it covered large areas of the bottom, displaced native plants and animals, disrupted the natural food chain, seriously impacted recreational uses of the lagoon, and spread to adjacent areas. The eradication of *Caulerpa* from the lagoon alone cost several million dollars.

Due to concerns regarding similar damaging effects of introduced species into the marine environment, California established the Marine Invasive Species Program (MISP) in CDFW's Office of Spill Prevention and Response (OSPR). The MISP coordinates with other state agencies, including the CSLC, to control introductions of non-indigenous species (NIS) from the ballast of ocean-going recreational and commercial vessels. Other pathways for the introduction of NIS into marine waters are from fouling organisms attached to vessels, and the introduction of fishes, invertebrates, and seaweeds intentionally brought to California waters to establish new populations for fisheries or aquaculture. A statewide monitoring program detects the potential introduction of NIS into marine waters. Although MISP is primarily focused on bays and harbors, a statewide coastal survey was completed in 2007 (CDFW 2008) to document the presence of NIS in coastal habitats. Only six NIS were detected from the open coast during a baseline survey conducted in 2004. The survey sampled 22 areas spanning California's outer coast, and targeted prominent headlands near to shipping lanes and potential entrainment areas that may have increased larval settlement.

The 2007 MISP survey identified known introduced species; species that could not be determined if they were native or introduced were classified as "cryptogenic." Three sites near SONGS, Dana Point to the north and Point La Jolla and Point Loma to the south, were included in the MISP survey, which identified the following NIS at these locations.

- *Sargassum muticum*, a brown algae and *Caulacanthus ustulatus*, a red algae, were found at all three sites. *Sargassum muticum* can form extensive beds that displace other native kelps and organisms. *Caulacanthus* is a short turf algae that appears to displace invertebrates, such as barnacles, limpets, and periwinkles, but also facilitates a diverse array of meiofauna and macroalgae, due to the habitat it forms in the upper intertidal where turfs are uncommon (Smith et al. 2014).
- The red algae, *Lomentaria hakodatensis*, was only found at Dana Point; a tunicate, *Botryllus schlosseri*, was only found at Point La Jolla; and the bivalve, *Musculista senhousia*, was only found at Point Loma.

Both *S. muticum* and *S. horneri*, have been recorded from artificial reef project monitoring at the SMK and Barn Kelp forests (Dan Reed, pers. comm.). Although neither of these NIS is reported to occur in high abundance in the two areas, there are concerns about the rapid spread of *S. horneri* (initially identified as *S. filicinum*) from its initial discovery in Long Beach Harbor in 2007 (Miller et al. 2007). Miller and Engle (2009) report on the rapid expansion of *S. horneri* near Santa Catalina Island and its potential to displace native giant kelp. Expansion of NIS like *S. horneri* can be facilitated by disturbances that cause the loss of native species and create open space for NIS to recruit.

4.4.3 Regulatory Setting

Relevant federal and state laws, regulations, and policies that pertain biological resources are summarized in Appendix A. Biological resources near the Proposed Project site are present on federal lands within the MCBCP owned by the DoN and state lands offshore. No local ordinances or policies specifically address biological resources in the study area.

4.4.4 Significance Criteria

The significance criteria used to evaluate the Project impacts to biological resources are based on Appendix G of the State CEQA Guidelines. According to Appendix G of the State CEQA Guidelines, a significant impact would occur if the Project would:

- Result in prolonged disturbance to, or destruction of, the habitat (or its functional habitat value) of a species that is recognized as biologically or economically significant in federal, state, or local policies, statutes, or regulations; result in a net loss in the functional habitat value of an Environmentally Sensitive Habitat Area (ESHA), including but not limited to vernal pools, beach, sea bird rookeries, or other areas of special biological significance.
- Have a high likelihood of causing a substantial decline in the local population of a federal- or state-listed threatened, endangered, or candidate species, or loss or disturbance to federally designated critical habitat; has a high likelihood of causing substantial decline in the local population of any other regulated, fully protected, candidate, sensitive or special status species identified under federal, state, local, or regional plans, policies and regulations, or by CDFW and USFWS; or results in any "take" of an endangered, threatened, or candidate species, CDFW fully protected species, or other special-status species.[37]
- Generate noise that might be considered a Level B Harassment, which is defined under the MMPA as, any act of pursuit, torment, or annoyance which has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering but which does not have the potential to injure a marine mammal or marine mammal stock in the wild.
- Create an adverse effect on waters of the U.S., waters of the State, or other jurisdictional waters through direct removal, filling, hydrological interruption, or other means.

[37] **Likelihood** is a professional judgment or assertion reasonably supported by evidence, precedent, or reasoned assessment of other established information. In this context, **substantial** is defined as any change that could be detected over natural variability and occurs for more than 6 months, while **local** is used to define any population or habitat occurring within 3 miles of the Proposed Project area and activities on a permanent or intermittent basis. **Take** is defined in the federal ESA as "harass, harm, pursue, hunt, shoot, wound, kill trap, capture, or collect, or to attempt to engage in any such conduct," and in CESA as to "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill."

- Interfere with established native resident or migratory wildlife corridors or the use of native wildlife nursery sites.
- Conflict with an adopted Habitat Conservation Plan, Natural Communities Conservation Plan, or other conservation plan protecting biological resources.

4.4.5 Environmental Impact Analysis and Mitigation

This section presents the environmental impacts of the Proposed Project on terrestrial and marine biological resources. Table 4.4-5 at the end of this section provides a summary of the Project's potential impacts related to biological resources, and any mitigation or Applicant-proposed measures (MMs or APMs) recommended to reduce impacts to a level that is less than significant.

4.4.5.1 Terrestrial Biological Resources

Most of the terrestrial study area consists of pavement and structures with a low potential to support sensitive plants or wildlife. Direct impacts to terrestrial resources are defined as those that result from a project and occur at the same time and place. For biological resources, direct impacts include clearing or trampling of vegetation, loss of breeding sites and habitat, disturbance to wildlife from construction or demolition of structures, and mechanical crushing of animals or their burrows by vehicles or equipment. Direct impacts to terrestrial biological resources would be limited to disturbed vegetation in the SSA and NOCA areas, and to wildlife species that use human-made structures to roost or nest. Figures 4.4-2 through 4.4-4 show special-status terrestrial species and habitats in the study area and indicate which areas would be subject to disturbance from Proposed Project activities. (See also Figure 2-2 for a description of each site component.)

Indirect impacts are caused by a project but can occur later in time, are farther removed in distance, and are reasonably foreseeable and related to the Proposed Project. Indirect impacts can include the disruption of native seed banks, disruption of prey base or increased predation through alterations of the physical landscape from Proposed Project features, increased erosion and degradation of water quality, changes in water runoff due to alterations in topography, noise and vibration from demolition, and spread of invasive species. In addition, excessive fugitive dust can reduce photosynthetic capacity in plants over time and inhibit reproduction by physically coating reproductive structures or excluding insect pollinators. Indirect impacts could occur in natural vegetation communities adjacent to the NOCA, SSA, Switchyard Area (SYA), Make Up Demineralizer Area (MUDA), South Yard Facilities Area (SYFA), Shoreline and Offshore Facilities (SOF), and South Protected Area Yard (SPAY) (see Figure 2-2).

Table 4.4-3 summarizes potential direct and indirect impacts on sensitive terrestrial resources that ~~would~~ have the potential to be present in the Proposed Project area or terrestrial study area during decommissioning.

Table 4.4-3. Potential Impacts of Proposed Project on Terrestrial Resources

Impact	Resource								
	Sensitive Plants and Habitat	San Diego or Riverside Fairy Shrimp	Coastal California Gnatcatcher	Sensitive Amphibians or Reptiles	Nesting Birds	Sensitive Mammals	Sensitive Bats	Jurisdictional Features or Vernal Pools	Wildlife Corridors
Contribute to the Loss and Degradation of Sensitive Habitat	●	●	●	●	●	●	●		●
Adversely Affect Terrestrial Special-Status Species.		●	●	●	●	●			
Disturb Non-Listed Roosting or Breeding Bats							●		
Modify Potential Onshore U.S./, Waters of the State								●	
~~Interfere with Established Native Resident or Migratory Wildlife Corridors~~									~~●~~
Conflict with an Adopted Habitat Conservation Plan, Natural Communities Conservation Plan, or Other Adopted Conservation Plan	●	●	●	●	●	●	●	●	●

4.4.5.2 Marine Biological Resources

Proposed Project activities could affect benthic habitats (intertidal and subtidal), surfgrass, kelp, microscopic plankton (phytoplankton, zooplankton, and larvae of marine organisms), and larger species, including invertebrates, fish, marine mammals, birds, and sea turtles. Invasive and non-native species that may be present are also discussed below. The disposition of ~~o~~Onshore ~~s~~Site components could also generate runoff that could indirectly affect marine biological resources if it increases sedimentation or introduces that impact biologically significant habitats such as surfgrass beds and kelp forests. The only decommissioning activities that could result in direct impacts to marine resources are associated with the disposition of the Shoreline and Offshore Facilities (SOF) including the removal of offshore intake and discharge conduit components (Units 2 & 3), the fish return system conduit, and navigational and environmental monitoring buoys

The Proposed Project includes removal of all Manhole Access Port Structures (MAPS) from the conduits, the POIS, and the Auxiliary Offshore Intake Structures (AOIS) from both intakes, and six diffuser ports from each of the two discharge conduits. All structures

would be removed to 4 feet below the seabed. The fish return system conduit would be cut off at its terminus and capped with a mammal exclusion barrier. All environmental monitoring and navigational buoys and anchor blocks (sinkers) would also be removed. The potential for impacts on marine resources due to the Proposed Project are listed in Table 4.4-4. The impacts in Table 4.4-4 are defined as consequences of Proposed Project activities that may interact with marine resources.

Table 4.4-4. Potential Impacts of Proposed Project on Marine Resources

Impact	Resource												
	Cobble and Sandy Beach	Surfgrass	Soft Subtidal Habitat	Hard Subtidal Habitat	Benthic Infauna	Benthic Epifauna	Plankton	Pelagic Fishes	Benthic Fishes	Seabirds	Marine Mammals/Turtles	Listed Species	Essential Fish Habitat
Degrade marine habitats due to runoff of pollutants from shore-based activities	●	●	●	●	●	●	●	●	●		●	●	●
Increase risk of oil spills	●	●	●	●	●	●	●	●	●	●	●	●	●
Release of hydrogen sulfide (H_2S) from intake and discharge conduits	●	●	●	●	●	●	●	●	●	●	●	●	●
Seabed Disturbance, Dredging, and Debris Accumulation		●	●	●	●	●		●	●		●	●	●
Harassment of Marine Life								●	●	●	●	●	●
Spread of invasive and non-native species				●		●							

Although the impacts are listed based on the range of resources potentially affected, the order is not intended to represent their potential severity. Discussions of each of the potential impacts are provided in the following sections, which will include a brief summary description of the impact followed by its level of significance, a description of the nature and magnitude of the impact, and the logic and steps used in the determination of the impact's significance.

ENVIRONMENTAL IMPACT ANALYSIS

Impacts of the proposed Project and recommended mitigation measures (MMs) are examined in this section.

Impact BIO-1: Contribute to the Loss and Degradation of Sensitive Habitat.

Onshore decommissioning activities could affect rare plants and sensitive habitats **(Less than Significant with Mitigation).**

Impact Discussion

The Proposed Project would directly disturb approximately 2 acres of already disturbed or ruderal vegetation and 87 acres of developed lands in the SSA (see Figure 4.4-1), areas with a limited potential to support sensitive plants. Although no federal- or state-listed threatened or endangered plants have been recorded in the terrestrial study area, several rare plant species may occur in areas characterized by coastal sage scrub and in vernal pools. The California Coastal Commission (CCC) considers coastal sage scrub and vernal pool habitat as ESHAs. One species is thread-leaved brodiaea, a perennial herb that grows in clay or saline soils of valley grasslands, foothill woodlands, coastal sage scrub, and wetland or riparian areas. The closest records are less than 3 miles north and east of the Proposed Project. San Diego button-celery, a perennial or biennial herb that occurs in vernal pools, such as within the adjacent San Onofre Vernal Pool Restoration Area, has also been recorded in the southern extent of the MCBCP less than 7 miles south of the Proposed Project. (CH2M Hill 2016a).

Several special-status plants have been recorded outside the Proposed Project disturbed area (see Figure 4.4-2). Little mousetail, Pendleton button-celery, small-flowered microseris, vernal barley, and wooly seablite have been found in or around the Vernal Pool Restoration Area. Woolly seablite as well as California box-thorn also occur on the upper slopes of the coastal bluffs southeast of SONGS, and one occurrence of red sand verbena was recorded in the coastal bluff scrub at the base of the cliffs in this area. Additional plant species that have a high potential to occur near the Proposed Project area include: Aphanisma; Blochman's dudleya; chaparral ragwort; Coulter's goldfields; Coulter's saltbush; many-stemmed dudleya; prostrate vernal pool navarretia; and south coast saltscale (BonTerra 2012; see also Table F1-1 in Appendix F1).

The Proposed Project would not directly impact coastal sage scrub or other sensitive natural communities, but may indirectly affect coastal sage scrub and vernal pools in adjacent areas. For example, indirect impacts could result from dust, altered hydrology from the removal of hardscape (i.e., paved areas), use of paved areas for staging and hauling (for instance parking Lot 4 is adjacent and upslope to the San Onofre Vernal Pool Restoration Area), or the spread of non-native and invasive plant species to adjacent habitats that support or have the potential to support state and federally listed threatened, endangered, or CRPR list species.

Erosion from newly exposed soil may also result in sediment deposition in vernal pool habitat, altering the hydrology of the pools and their micro-watersheds. However, the Proposed Project includes the following Applicant-proposed measure (APM), also required under Clean Water Act Section 402, to prevent adverse effects to the vernal pool restoration area (see Table 4-2, *Applicant-Proposed Measures*).

- **APM-12: Stormwater Pollution Prevention Plan (SWPPP)** (Section 4.9, *Hydrology and Water Quality*).

The SWPPP would require best management practices (BMPs) to prevent and control erosion and siltation during demolition; prevent, contain, and mitigate accidental spills during demolition; and address treatment and disposal of any dewatered groundwater to prevent violation of water quality objectives or damaging beneficial uses.

In addition, the Proposed Project also includes an APM to stabilize dust emissions by using water or chemical stabilizer/suppressant as necessary.

- **APM-4: Dust Suppression** (Section 4.3, *Air Quality*).

Indirect impacts to sensitive plants and coastal sage scrub habitat from the potential spread of invasive plant species would be considered a significant impact. With implementation of APM-4 and APM-12, impacts to native vegetation, habitats, and sensitive plants would be reduced; however, not to a less-than-significant level.

Mitigation Measures

With implementation of **MM BIO-1a** (which also addresses impacts to special-status species), **MM BIO-1b**, and **BIO-1c**, impacts to native vegetation, habitats, and sensitive plants would be less than significant.

MM BIO-1a: Worker Environmental Awareness Program. A Worker Environmental Awareness Program (WEAP) shall be developed and provided to California State Lands Commission (CSLC) staff for review and approval at least 60 days prior to Proposed Project implementation. The WEAP shall include:

- A CSLC-approved biologist to conduct the training who is qualified to discuss both potential onshore and offshore species.
- A discussion of all sensitive species that may be encountered adjacent to and at the Proposed Project site, the laws and codes that regulate these species, and the protection measures that must be followed to avoid and minimize impacts.
- The process of reporting any dead or injured special-status wildlife species found at the Proposed Project site, including notification to the CSLC and applicable agencies.

~~Prior to Project implementation, t~~The Applicant or its contractor shall provide to the CSLC evidence that all on-site personnel have completed the educational training prior to the start of ~~ground disturbance~~ work onsite. A weather-protected bulletin board or binder shall be centrally placed or kept on site in an easily accessible area for the Project duration.

MM BIO-1b: ~~Habitat Restoration and Revegetation Plan~~Weed Management.

~~The Applicant shall prepare a Habitat Restoration and Revegetation Plan. The Plan shall include:~~

- ~~Plans for soil-contouring, restoration, enhancement, and revegetation of soil exposed by removal of hardscape within the San Onofre Nuclear Generating Station facility, which shall include at a minimum (a) the plant species to be used; (b) seed and cutting collecting guidelines; (c) a schematic depicting the mitigation area; (d) time of year that the planting will occur and the methodology of the planting; (e) a description of the irrigation methodology for container, bareroot, or other planting needing irrigation; (f) measures to control exotic vegetation on site; (g) success criteria; (h) a detailed monitoring program; and a (i) a weed monitoring plan.~~

~~Weed monitoring shall include restoration areas and controlling the spread of invasive plants in demolition areas. Measures to control the introduction and spread of noxious weeds in the Project work area shall be taken as follows: (1) all plant materials used during restoration shall be native, certified weed-free, and approved by the California State Lands Commission (CSLC) and Department of the Navy (DoN) staffs; (2) site-dedicated vehicles shall be used to the extent feasible and all equipment accessing unpaved areas from off-site shall be washed (including wheels, undercarriages, and bumpers) at existing construction yards or legally operating car washes before entering unpaved areas; (3) tools such as chainsaws, hand clippers, pruners, etc. shall be washed before and after entering all unpaved project work areas; (a written daily log shall be kept for all vehicle/equipment/tool washing that states the date, time, location, type of equipment washed, methods used, and staff present. Logs shall be available to the CSLC and DoN staffs for inspection at any time and shall be submitted monthly.~~

~~The Applicant shall submit the Plan to CSLC staff, for review and approval by CSLC staff in consultation with the DoN, U.S. Fish and Wildlife Service, and California Department of Fish and Wildlife staffs, no more than 60 days after completion of demolition activities.~~

To control the introduction and spread of invasive weed species in disturbed areas, measures shall be implemented following the completion of Proposed Project activities, where necessary. Control measures may include physical (hand-pulling, mechanical removal) and chemical (herbicide application) treatment methods. These control methods shall be dependent on the weed species, location of the weeds, and the time of year that weed control operations occur. Vehicles that will travel off-pavement and tools such as chainsaws, hand clippers, pruners, etc. shall be washed before and after entering all unpaved Project work areas. Logs of equipment and tools washed shall be available to the CSLC for inspection at any time.

MM BIO-1c: Rare Plant Surveys. The Applicant or its contractor shall implement the following tasks to mitigate the Project's direct and indirect impacts to special-status plants.

- **Surveys.** Prior to initial ground disturbance, a California State Lands Commission (CSLC)-approved, qualified plant ecologist or botanist shall conduct surveys for special-status plants (state- and federally- listed threatened and endangered, proposed, petitioned, and candidate plants and California

Rare Plant Rank [CRPR] 1 and 2 plants) in all areas subject to ground-disturbing activity containing suitable habitat and the surrounding areas within 100 feet when access is feasible. The surveys shall be conducted during the appropriate blooming period(s) according to protocols established by the U.S. Fish and Wildlife Service (USFWS), California Department of Fish and Wildlife (CDFW), and California Native Plant Society (CNPS). Surveys shall be valid for a period of 3 years. If vegetation removal or initial site disturbance in a surveyed area does not occur within 3 years, surveys must be repeated. All listed plant species found shall be marked and avoided, if feasible.

Any populations of special-status plants found during surveys shall be fully described, mapped, and a CNPS Field Survey Form or written equivalent shall be prepared. A report detailing the results of each rare plant survey shall be provided to the CSLC staff 30 days prior to ground disturbance.

- **Avoidance.** Prior to any grading, vegetation clearing, or site disturbance, the Applicant or its contractor shall delineate the limits of disturbance with lathe, snow fencing, or other suitable markers. Prior to grading or vegetation removal, any populations of special-status plants (and areas of ESHA) identified during the surveys within the Proposed Project footprint and surrounding 100-foot area shall be protected and construction fencing established around each population. The buffer for herbaceous and shrub species shall be, at a minimum, 50 feet from the perimeter of the population or the individual. A smaller buffer may be established, provided there are adequate measures in place to avoid the take of the species, in coordination with USFWS and CDFW staffs. If impacts to listed plants cannot be avoided, USFWS and CDFW staffs shall be consulted for authorization, with notification to the CSLC. If Project activities result in the loss of more than 10 percent of an onsite population of any CRPR 1 plant species, mitigation shall be required as described below.
- **Salvage.** If Project activities result in the loss of more than 10 percent of an onsite population of any CRPR 1 plant species, the Applicant or its contractor shall develop a Salvage and Relocation Plan based on the life history of the species affected. The Plan shall include at minimum: (a) collection/salvage measures for plants or seed banks, to retain intact soil conditions and maximize success likelihood; (b) details regarding storage of plants or seed banks; (c) location of the proposed recipient site, and detailed site preparation and plant introduction techniques; (d) time of year that the salvage and replanting or seeding will occur and the methodology of the replanting; (e) a description of the irrigation, if used; (f) success criteria; and (g) a detailed monitoring program, commensurate with the Plan's goals.

  The Salvage and Relocation Plan shall be submitted to CSLC staff for review and approval by CSLC staff in consultation with USFWS and CDFW staffs, a minimum of 30 days prior to start of salvage activities.

Impact BIO-2: Adversely Affect Terrestrial Special-Status Species.

Indirect effects from Proposed Project activities could harm terrestrial special-status invertebrates, amphibians, reptiles, birds, and mammals **(Less than Significant with Mitigation).**

Impact Discussion

Invertebrates

San Diego fairy shrimp are present in the San Onofre Vernal Pool Restoration Area adjacent to Parking Lot 4. Although not detected, Riverside fairy shrimp may also occur. The Proposed Project would not directly impact fairy shrimp; however, indirect effects could occur from dust, altered hydrology from removing hardscape (i.e., paved areas), or from the spread of invasive plants. Erosion from newly exposed soil may also result in the deposition of sediment in vernal pool habitat, altering the life history stages of the fairy shrimp. The removal of hardscape would result in exposed soil that would be susceptible to the colonization of invasive plants. Non-native and invasive plant species may spread to the vernal pools, degrading habitat for fairy shrimp. Degradation of vernal pool habitat or any effects to fairy shrimp would be a significant impact.

APM-12 and APM-4 would reduce impacts to water quality, prevent impacts to the vernal pool complex through stabilization of adjacent areas, and control fugitive dust. Implementation of **MM BIO-1a** and **MM BIO-1b**, described under Impact BIO-1, would educate workers on avoiding fairy shrimp and vernal pool habitat and provide weed management. These measures would reduce impacts to special-status invertebrates to a less-than-significant level.

Amphibians and Reptiles

Since the Proposed Project area is surrounded by or near roads and frequent human activity, the likelihood for special-status amphibians and reptiles to occur is low. However, some special-status species may occur in or near areas that may be disturbed during reconfiguration of site access roads and entrances (e.g., in coastal sage scrub in the SSA and ruderal habitat in the NOCA). These SSCs include western spadefoot, coast horned lizard, Coronado Island skink, orange-throat whiptail, and red-diamond rattlesnake. Spadefoot toad may also occur in the vernal pool complex next to Parking Lot 4.

If present, direct impacts may include being hit by vehicles and mechanical crushing during access road reconfiguration or during the removal of pavement and other facilities. Indirect impacts to these species include soil compaction, alteration in hydrology to the vernal pool complex, and the introduction of exotic plant species. Reptiles and amphibians occupy burrows and other refugia and may be killed during clearing and

grading activities if they do not readily vacate an area that is subject to disturbance. The loss of these species would be a significant impact.

APM-12 and APM-4 would control fugitive dust and reduce impacts to water quality. Implementation of **MMs BIO-1a** and **BIO-1b**, described under Impact BIO-1, would educate workers on avoiding these species and ~~restore, enhance, and re-vegetate soil exposed by removal of hardscape~~would provide weed management after final site stabilization within the Proposed Project area. In addition, **MM BIO-2a** would require monitoring and allow for removal of the species from the construction area. These measures would ensure impacts to special-status reptiles and amphibians are less than significant with mitigation.

Birds

The Proposed Project site provides foraging, cover, and breeding habitat for a variety of resident and migratory birds. Common and special-status bird species likely nest in vegetation and on existing Project structures in and adjacent to the ~~o~~Onshore ~~s~~Site facilities that would be dismantled during demolition activities. Direct impacts to nesting birds include ground-disturbing activities associated with grading and road paving to support site access for construction equipment and the demolition of existing facilities. Demolition during the breeding season (February 1 to August 15) could result in the displacement of breeding birds and the abandonment of active nests, as well as a disruption in foraging activity. Indirect impacts to nesting birds could include the loss of habitat due to the colonization of weeds, dust, or human disturbance (including noise from decommissioning activities). Breeding birds and other wildlife may temporarily or permanently leave their territories to avoid construction activities, which could lead to reduced reproductive success and increased mortality.

Depending on the species, birds may actively nest on the ground close to or on idle construction equipment. In southern California, birds have been documented nesting on vehicles, foundations, construction trailers, and equipment left overnight or during a long weekend. Except for a few non-native birds such as European starling and house sparrow, the loss of active bird nests or young is regulated by the Federal MBTA and Fish and Game Code section 3503 and would be considered a significant impact.

The burrowing owl is a California Bird Species of Special Concern and USFWS Bird of Conservation Concern. A wintering burrowing owl was observed in the SSA in 2004 and may occur in ruderal and scrub communities at any time of year; however, no breeding has been documented on the site. The federally protected American peregrine falcon occurs in MCBCP; however, it has not been documented on the SONGS site. This species could nest on structures that would be removed as part of the Proposed Project. Nest failure from direct or indirect disturbance by Proposed Project activities to these species would be considered a significant impact.

Coastal California gnatcatcher is federally listed as threatened, and any impacts to its habitat, nests, or indirect impacts from disruption of nesting behavior would be an incidental take, and would be considered a significant impact. Coastal California gnatcatcher are also known to occur in the area and nesting has been documented in the coastal sage scrub habitat located in the SSA along Beach Club Road. Coastal California gnatcatcher will leave an area that is subject to disturbance; however, during the breeding season, nestlings are confined to the nest and vulnerable from vegetation clearing or other impacts that drive the parents from the area. Nest failure can result if disturbance prevents the adults from incubating eggs or tending to their nestlings.

For example, if vegetation clearing or construction activities occur within 500 feet of occupied habitat between February 15 and August 31, the Proposed Project may result in direct or indirect impacts to coastal California gnatcatcher nests. Proposed Project areas within 500 feet of coastal sage scrub include SSA, NOCA, SYA, MUDA, SYFA, TBA, U3A, and SPAY. Direct impacts include ground-disturbing activities and vegetation removal of 2 acres of disturbed or ruderal vegetation. The Proposed Project would not remove any coastal sage scrub habitat. Indirect impacts would include noise from heavy equipment, increased human presence, and exposure to fugitive dust during the breeding season, which could result in the displacement of breeding birds and the abandonment of active nests, as well as a disruption in foraging activity.

APM-8 would deter nesting in the Proposed Project area during D&D. **MMs BIO-1a** and **BIO-1b** would educate workers on avoiding the loss of nesting birds and foraging habitat, and would reduce impacts to nesting habitat. In addition, with the implementation of **MMs BIO-2b**, **BIO-2c**, **BIO-2d**, ~~and~~ **BIO-2e**, and **BIO-2f**, impacts to nesting birds, including burrowing owl, Western snowy plover, California least tern, and Coastal California gnatcatcher, would be further reduced to less than significant.

Mammals

There are no known threatened or endangered mammals expected to occur in the onshore Proposed Project area. However, although not detected during surveys, the onshore Proposed Project area may support a variety of small rodents considered to be SSC by the CDFW. These include the dulzura pocket mouse, north-western San Diego pocket mouse, and San Diego desert woodrat. These species are not expected to occur in developed areas, but may occur in scattered locations in the adjacent coastal sage scrub habitat within the SSA along Beach Club Road.

The reconfiguration of site access roads and entrances may directly impact up to 2 acres of disturbed or ruderal vegetation. Given the limited extent of impacts to potentially occupied habitat for road reconfiguration, the existing habitat disturbance along the road shoulders, and the fact that these areas have been cut off from large tracts of intact habitat for many years, the loss of habitat for these species is considered less than significant.

However, potentially significant direct impacts to these species could occur due to vehicles and construction equipment, trampling, and dust along Beach Club Road. Construction disturbance can also result in the flushing of small animals from refugia which increases the predation risk. Indirect impacts include alteration of soils, such as compaction that could preclude burrowing, and the spread of exotic weeds.

Given that disturbance would be limited to ruderal or disturbed habitat and coastal sage scrub habitat within the SSA and is surrounded by or near roadways and frequent human activity, the likelihood that special-status mammals occur is low. Nonetheless, impacts to special-status mammals, should they occur, would be considered significant absent mitigation. **MMs BIO-1a** and **BIO-1b**, described above under Impact BIO-1, would educate workers on avoiding impacts to special-status mammals and reduce impacts to special-status mammals to a less-than-significant level with mitigation.

SCE commits to implementing the following APMs to reduce ensure impacts to special-status species; however, not to a less-than-significant level.

APM-4: Dust Suppression (Section 4.3, *Air Quality*).

APM-8: Nesting Bird Deterrents. The Applicant ~~and/~~or its contractor shall implement nesting bird deterrents, to deter nesting within and adjacent to active decommissioning areas. Deterrents could include, but are not limited to, the following:

- Prior to the nesting season, remove vegetation from areas that would be directly disturbed by Proposed Project Decontamination and Dismantlement activities.
- Create disturbance by removing or moving equipment, vehicles, and materials on a daily basis within active decommissioning areas and yards.
- Use mooring balls placed in inactive nests, directly on structures, or in other potential nest locations.
- Install appropriate-sized mesh netting on decommissioning equipment and materials in staging areas, laydown yards, and other Proposed Project facilities and work areas.
- Place wires or wire spikes on towers, buildings, or other facilities to discourage birds from perching and nesting on these structures.
- Hire a U.S. Fish and Wildlife-permitted falconer to fly raptors in the area to deter birds from perching or nesting on structures.
- Install visual deterrents such as tangle guard bird repellent ribbon in active decommissioning areas, yards, and on materials and equipment.
- Cover straw wattle and other potential nesting materials in active decommissioning areas and yards.
- Wrap, stuff, or cover ends of pipes or other materials within which birds could nest.

- Use colored gravel, such as red or white, in active decommissioning areas and yards.
- Manage trash in a manner to reduce potential point food sources in active decommissioning areas and yards.

The Applicant ~~and/~~or its contractor and the construction team shall consult with the California State Lands Commission staff (or its contracted monitor) and California Department of Fish and Wildlife staff (if requested) to determine specific locations for the use of exclusionary or deterrent devices.

APM-12: Stormwater Pollution Prevention Plan (SWPPP) (Section 4.9, *Hydrology and Water Quality*).

Mitigation Measures

Implementation of the following MMs would be sufficient to reduce impacts to special-status species to a less-than-significant level.

MM BIO-1a: Worker Environmental Awareness Program.

MM BIO-1b: ~~Habitat Restoration and Revegetation Plan~~Weed Management.

MM BIO-2a: Special-Status Reptiles and Amphibians. Prior to any ground disturbance to the coastal sage scrub in the Supplemental Support Areas (SSAs) and the ruderal habitat in the North Owner Controlled Area (NOCA)~~, and daily during decommissioning activities~~, the Applicant or its contractor shall retain a qualified herpetologist(s) with demonstrated expertise and all required permits to handle special-status reptiles and amphibians that could occur onsite. The herpetologist(s) shall survey the SSA and NOCA habitat areas prior to ground-disturbing activities and monitor the areas daily when Propsoed Project activities would occur. ~~, to survey and monitor the reconfiguration of site access roads and external demolition activities proposed within the Supplemental Support Area.~~ In addition:

- Any special-status reptiles or amphibians found within a Project impact area shall be relocated to suitable habitat outside the impact area by the biological monitor(s) in coordination with the U.S. Fish and Wildlife Service (USFWS) or the California Department of Fish and Wildlife (CDFW).
- The biological monitor(s) shall have the authority to temporarily halt work to avoid impacts to special-status species or other protected biological resources.
- Survey results shall be provided to California State Lands Commission, Department of the Navy, USFWS, and CDFW staffs within 30 days of the survey.

MM BIO-2b: Surveys and Monitoring for Nesting Birds. A qualified biologist with demonstrable experience surveying for active bird nests and monitoring shall conduct surveys for breeding birds protected by the Migratory Bird Treaty Act and Fish and Game Code no more than 72 hours prior to construction and

removal activities carried out during the breeding season (from February 1 to September 15).

- Nesting bird surveys shall be performed in all potential nesting habitat within 500 feet of construction activities, including stationary construction equipment and structures to be removed. The 500-foot survey area may be reduced if topography and/or buildings screen visual and noise impacts.
- If an active nest is detected, a no-disturbance buffer around the active nest site(s) (typically 300 feet for most species and up to 500 feet for raptors) shall be established around the nest. For a non-listed species, ~~T~~the prescribed buffer may be adjusted by the biologist in coordination with the U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Wildlife (CDFW), and the Department of the Navy (DoN). The biologist shall conduct regular monitoring of the nest to determine success/failure and to ensure that Project activities are not conducted within the buffer(s) until the nesting cycle is complete.
- The biologist shall be responsible for documenting the results of the surveys and the ongoing monitoring and shall provide a copy of the survey and monitoring reports to the California State Lands Commission, DoN, USFWS, and CDFW staffs within 30 days of the survey.

MM BIO-2c: Burrowing Owl. A qualified biologist with demonstrable experience surveying and monitoring active burrowing owl burrows shall conduct focused burrowing owl surveys no more than 72 hours prior to: (1) the disturbance of coastal sage scrub and ruderal habitat types regardless of time of year, with the survey area to include the Proposed Project area in addition to a 500-foot buffer around the Proposed Project area; and (2) demolition or ground disturbing activities occurring during the breeding season (between February 1 and August 31), with the survey area to include all potentially occupied habitat within 500 feet of demolition or ground disturbing activities.

- Focused surveys shall follow the protocols set forth in the Staff Report on Burrowing Owl Mitigation (California Department of Fish and Game 2012).
- Should an inhabited nest be identified, direct impacts to active nest burrows shall be prohibited until the young have fledged, and shall only proceed after replacement burrows have been provided outside of the disturbance and 500-foot buffer areas. Demolition and ground disturbance shall be prohibited within 500 feet of active nest burrows to allow adults to raise young until fledglings can forage independently. The prescribed buffer may be adjusted by the biologist in coordination with the U.S. Fish and Wildlife Service (USFWS), California Department of Fish and Wildlife (CDFW), and the Department of the Navy (DoN).
- A copy of the survey reports shall be provided to California State Lands Commission, DoN, USFWS, and CDFW staffs within 30 days of the survey.

MM BIO-2d: Western Snowy Plover/California Least Tern. A qualified biologist with demonstrable experience surveying and monitoring western snowy plovers, California least tern, and their nests shall conduct surveys of appropriate habitat

for these species and their nests within 500 feet of the Project site no more than 72 hours prior to ground disturbing activities occurring during the breeding season (March 1 to August 31).

- If an active nesting site is observed during the surveys, a no-disturbance buffer shall be maintained 500 feet from the site and work in the area shall be postponed until the young have fledged. The prescribed buffer may be adjusted by the qualified biologist in coordination with U.S. Fish and Wildlife Service (USFWS), California Department of Fish and Wildlife (CDFW), and the Department of the Navy (DoN).
- If individuals are observed outside of the breeding season within 500 feet of the work area, the qualified biologist shall establish a no-disturbance buffer until it can be verified that the individuals have left the area. If individuals are routinely observed in or within 500 feet of the work area, or do not leave the work area, a species avoidance plan shall be developed in coordination with USFWS and CDFW.
- If no individuals are observed in accordance with the survey protocols, no buffers shall be required.
- A copy of the survey reports shall be provided to California State Lands Commission (CSLC), DoN, USFWS, and CDFW staffs within 30 days of the survey, and (if required) the species avoidance plan shall be submitted to CSLC staff for review and approval in coordination with other agencies.

MM BIO-2e: Coastal California Gnatcatcher. A qualified avian biologist with appropriate federal permits shall conduct protocol-level surveys for coastal California gnatcatchers in coastal sage scrub habitat within 500 feet of ground disturbing and construction activities. The surveys shall include at least one survey no more than 72 hours prior to construction activities during the nesting season (February 15 to August 31) until the completion of ~~decommissioning~~ Proposed Project activities. The surveys shall include at least one survey no more than 72 hours prior to construction activities.

- If an active nest is detected, demolition activities shall be prohibited within a 500-foot buffer until the nestling(s) has fledged, as determined by the biologist. The prescribed buffer may be adjusted by the biologist in consultation with the U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Wildlife (CDFW).
- The surveys and monitoring reports shall be submitted to California State Lands Commission, Department of the Navy, USFWS, and CDFW staffs within 30 days of the survey or monitoring event.

MM BIO-2f: Noise Minimization Plan. The Applicant or its contractor shall prepare a Noise Minimization Plan which shall identify expected noise levels at Environmentally Sensitive Habitat Areas (ESHAs) where sensitive bird species may breed/nest, and shall describe all measures that will be implemented to minimize Proposed ~~p~~Project-generated noise within those areas. The plan shall include:

- A description of the basis for the expected noise levels at ESHAs and identification of modeling methods used to determine those levels.
- Identification of all measures to be implemented to reduce sound levels within those areas to no greater than 60 dBA or 5 dBA above ambient noise levels when active nests are present. Measures may include enclosing sound-generating sources within structures or temporary sound barriers, moving sound-generating sources to locations farther from these boundaries, reducing the number of concurrent sound generating activities, using sound baffles to redirect sound away from the ESHAs, timing restrictions, or other similarly effective measures needed to meet the 60 dBA limit or 5 dBA below ambient noise levels.
- The location and a description of sound monitoring equipment that will allow continuous monitoring of sound levels during Proposed ~~p~~Project activities.
- A description of how monitoring data will be compiled and reported to allow confirmation that sound levels do not exceed 60 dBA or 5 dBA above ambient levels within those areas when active nests are present.

The Noise Minimization Plan shall be submitted to CSLC staff for review and approval by CSLC staff, in consultation with USFWS and CDFW staffs, a minimum of 60 days prior to start of ~~decommissioning~~Proposed Project activities.

Impact BIO-3: Disturb Non-Listed Roosting or Breeding Bats.

Decommissioning activities could disturb roosting special-status bats or destroy roost sites **(Less than Significant with Mitigation).**

Impact Discussion

There are no bat species that could occur in the study area that are listed as threatened or endangered. Mexican long-tongued bat (*Choeronycteris mexicana*), pallid bat, western mastiff bat, and pocketed free-tailed bat are all SSC that have the potential to roost and breed in human-made structures in the study area. Most impacts to bat populations in the region result from disturbance of roosting or hibernation sites, especially where large numbers of bats congregate. Direct impacts to these species include mortality of individuals and permanent loss of roosting habitat resulting from demolition of structures in the study area. Bats are sensitive to disturbance and will usually vacate a roosting site the night following initial disturbance. However, newborn bats cannot fly for a period of 3 to 8 weeks following birth and are incapable of vacating roosting habitat. While the bat species that could occur in the study area are not listed as threatened or endangered, the loss of a roosting colony or maternity roost would be considered a significant impact.

Mitigation Measure

Implementation of **MM BIO-3** would prevent direct impacts to maternity roosts where young are present in the study area and reduce impacts to a less-than-significant level.

MM BIO-3: Sensitive Bat Species. Within ~~7~~ 14 days prior to dismantling and external demolition activities of the ~~o~~Onshore ~~s~~Site facilities, a qualified biologist with demonstrated expertise with bats shall conduct a pre-activity survey for roosting bats within Proposed Project structures. All Proposed Project structures with exterior openings shall be surveyed by a qualified bat biologist using radio telemetry and visual inspection, or other methods approved by the California Department of Fish and Wildlife (CDFW). The resume of the biologist and survey methodology shall be provided to the CDFW for concurrence prior to any Proposed Project activities, with a copy to California State Lands Commission (CSLC) and Department of the Navy (DoN) staff.

If active maternity roosts are found, impacts to the occupied structure shall be delayed until the end of the breeding period for the species identified. If delay is infeasible, the bat biologist shall survey the surrounding area using radio telemetry or other methods approved by CDFW to locate nearby alternative maternity colony sites. If the bat biologist determines that there are alternative roost sites used by the maternity colony, and young are not present, then no further action is required. However, if there are no alternative maternity roosts near the site, substitute roosting habitat for the maternity colony shall be provided on, or near, the terrestrial study area in consultation with CDFW and DoN staff prior to eviction of the colony. A copy of the survey, including how any impacts to the species were resolved, shall be submitted to CSLC, DoN, and CDFW staff within 30 days of completion.

Impact BIO-4: Potential Disturbance or Degradation of Onshore Waters of the U.S./ State.

The Proposed Project would result in removal of human-made stormwater conveyance systems and establish natural hydrology **(Less than Significant with Mitigation).**

Impact Discussion

The Proposed Project area supports a collection of concrete ditches that collect and direct storm water to the Pacific Ocean. These features do not provide habitat for native plants or wildlife. Implementation of the Proposed Project would result in the removal of these ditches from the SSA Parking Lot 4 and NOCA. Following their removal, new surface drainage patterns would be created on the site as part of site restoration, reestablishing drainage patterns in the area to a more natural condition. Although unlikely, the CDFW, San Diego Regional Water Quality Control Board (RWQCB), or U.S. Army Corps of Engineers (USACE) may deem the ditches waters of the state/U.S. In addition, the CCC may consider the ditches to be wetlands; if so, impacts to potential waters of the U.S./state due to Proposed Project activities could be considered a significant impact.

Mitigation Measure

Implementation of **MM BIO-4** would reduce impacts to potential waters of the U.S./State, under USACE, CDFW, CCC, or RWQCB jurisdictions to a less-than-significant level.

MM BIO-4: Potential Waters of the U.S./State. If the California Department of Fish and Wildlife (CDFW), California Coastal Commission, Regional Water Quality Control Board (RWQCB), or U.S. Army Corps of Engineers (USACE) determine that the concrete ditches onsite are waters of the state/U.S., the Applicant or its contractor shall obtain, and shall comply with all mitigation and conditions associated with, one or more of the following permits, as applicable: a CDFW Lake and Streambed Alteration Agreement; RWQCB Section 401 Water Quality Certification; or Section 404 USACE permit. Permit compliance shall be met through the purchase of in-lieu credits for non-vegetated streams at an approved mitigation bank, implementation of in-kind or out-of-kind restoration, or a combination of these actions. The mitigation replacement ratio shall be determined by the regulatory agencies during the permitting process. Evidence of compliance with agency requirements shall be provided to CSLC staff prior to ~~decommissioning~~ Proposed Project activities.

Impact BIO-5: Interfere with Established Native Resident or Migratory Wildlife Corridors.

The Proposed Project site is not located within an established migratory wildlife corridor **(No Impact).**

Impact Discussion

The Proposed Project area is largely developed, fenced, and is not contiguous with large blocks of open space. Roads and highways around the Proposed Project site currently limit its use as a movement corridor for many species. Site restoration activities may result in the establishment of additional native habitat that could be used by wildlife for movement and migration, but the presence of roads would continue to inhibit wildlife movement. No adverse impact would occur.

Mitigation Measures

No MMs are recommended for Impact BIO-5.

Impact BIO-6: Conflict with Adopted Conservation Plans.

The Proposed Project site could conflict with Conservation Plans adopted by the Marine Corps Base Camp Pendleton **(Less than Significant with Mitigation).**

Impact Discussion

The only conservation plan covering areas adjacent to the Proposed Project is the Integrated Natural Resources Management Plan (INRMP). Under the DoD, each military base that has suitable habitat for conserving and managing natural ecosystems is required to prepare, maintain, and implement an INRMP. The purpose of the INRMP is to assist Commanders at Camp Pendleton in their efforts to conserve and rehabilitate natural resources while ensuring the preparedness of the Armed Forces (MCBCP 2016a). As the Proposed Project includes the removal of nuclear facilities to facilitate future land uses by the MCBCP, it is not in conflict with the INRMP with the inclusion of protective measures. SCE commits to implementing the following APMs to reduce impacts associated with existing conservation plans; however, not to a less-than-significant level.

APM-4: Dust Suppression (Section 4.3, *Air Quality*).

APM-8: Nesting Bird Deterrents.

APM-12: Stormwater Pollution Prevention Plan (SWPPP) (Section 4.9, *Hydrology and Water Quality*).

Mitigation Measures

Implementation of the following MMs would be sufficient to reduce this impact to a less-than-significant level.

MM BIO-1a: Worker Environmental Awareness Program.

MM BIO-1b: ~~Habitat Restoration and Revegetation Plan~~Weed Management.

MM BIO-1c: Rare Plant Surveys.

MM BIO-2a: Special-Status Reptiles and Amphibians.

MM BIO-2b: Surveys and Monitoring for ~~Breeding~~ Nesting Birds.

MM BIO-2c: Burrowing Owl.

MM BIO-2d: Western Snowy Plover/California Least Tern.

MM BIO-2e: Coastal California Gnatcatcher.

MM BIO-2f: Noise Minimization Plan.

MM BIO-4: Potential ~~Onshore~~Waters of the U.S./State.

Impact BIO-7: Contribute to the Degradation of Marine Habitats.

Shore-based decommissioning activities could degrade marine habitats due to contaminated runoff **(Less than Significant).**

Impact Discussion

Runoff from stormwater or other discharges could occur during shore-based activities including the disposition of the SOF. Runoff can transport toxic pollutants from surfaces, such as vehicle parking or staging areas near shore (see Section 4.9, *Hydrology and Water Quality*), which could directly impact surfgrass and kelp canopy habitats, both of which qualify as HAPC under Pacific Coast FMPs. The direct and indirect effects to biological resources would largely depend on the constituents of the discharge, the toxicity tolerance of the organisms to a specific pollutant, or the effects of turbidity on the organisms affected. A reduction in light penetration and effects associated with the pollutants can affect the growth and health of these habitats. Direct effects include immediate mortality; indirect effects include latent mortality from weakening or changes in behavior that cause organisms to be more susceptible to predation. Bioaccumulation of pollutants, such as heavy metals, which affect organisms that eat other contaminated organisms, is another indirect effect. The impact to surfgrass and canopy kelp HAPC would depend on the volume, location, and spatial spread of a discharge plume in relation to habitat distribution. SCE has confirmed that the buoyancy of the discharge plume is not expected to be materially different even with the addition of wastewater from the Proposed Project (SCE 2018k – DR#7-13). Final discharge and flow rates anticipated from Proposed Project activities would be the same as those currently processed due to limits imposed both by agency permit and SONGS internal restrictions (SCE 2018k – DR#7-13). The current diffuser design promotes rapid mixing and would not require redesign for Proposed Project activities (SCE 2018k – DR#7-13).

Small discharges would likely only affect shoreline cobble and sand beach areas, which are not ~~habitat areas~~HAPC themselves, but can contain surfgrass and canopy kelp. However, surfgrass is adapted to temporary burial, and would likely survive inundation unless levels are severe or the condition is prolonged. Any runoff caused by stormwater is subject to weather conditions, but is unlikely to result in prolonged periods of inundation that would be sufficient to severely reduce the growth of surfgrass such that a noticeable decline could be detected over natural changes in abundance.

The areas of kelp canopy habitat in the Proposed Project area are further offshore, although smaller patches of kelp are plausible along the length of the conduits. However, the dilution effect of a shore-based source would potentially reduce the effects on this habitat type, and because of its presence at the surface of the water throughout most of its active growing season, unlike surfgrass which grows along the seabed, it is less vulnerable to turbid conditions reducing light intensity. Therefore, is unlikely that a substantial reduction in the quality or quantity of this HAPC would occur.

If stormwater or other runoff contains extremely toxic pollutants, these could directly and indirectly affect fishes, marine mammals, and sea turtles. Direct effects include mortality due to toxicity levels exceeding thresholds. Indirect effects include bioaccumulation or

delayed effects due to weakened physical condition, making organisms more susceptible to predation, competition, or disease. Toxic pollutants which may be stored onsite (in site storage, waste facilities, or construction equipment) include petrochemicals, lubricants for machinery, and other specialist chemicals that may be used during decommissioning. Improper storage combined with uncontrolled stormwater runoff could release these pollutants into the marine environment (see Section 4.9, *Hydrology and Water Quality*).

Larval fishes and targeted invertebrate larvae were surveyed at SONGS for assessments of the facility's intake entrainment effects, with the most recent study occurring in 2006 and 2007 (MBC Applied Environmental Science [MBC] 2007; SCE 2008). The most abundant larval fishes observed in the samples from that study were northern anchovy (*Engraulis mordax*), California grunion (*Leuresthes tenius*), silversides (Atherinopsidae) including jacksmelt (*Atherinopsis californiensis*), clinid kelpfish (*Gibbonsia* spp.), queenfish (*Seriphus politus*), combtooth blennies (*Hypsoblennius* spp.), gobies (Family Gobiidae), and white croaker (*Genyonemus lineatus*). Both fish eggs and larvae were most abundant in the samples collected during the spring. Some species, such as sea bass (*Paralabrax* spp.), were more abundant in the samples collected during the summer. Commonly observed species of rock crab megalops included brown rock crab (*Romaleon antennarium*), yellow crab (*Metacarcinus anthonyi*), and slender crab (*Cancer gracilis*). California spiny lobster phyllosoma larvae were also collected during the study.

The EFH identified as occurring within the marine study area would not be considered as HAPC under 50 CFR § 600.815(a)(8), as they are widespread throughout the local and regional area and, therefore, are not considered rare habitats for the area. While HAPCs provide refuge and forage areas, and constitute areas that species will spawn and reproduce within, these are not restricted or specialized breeding, foraging, or refuge areas and would not constitute HAPC under those conditions. These habitats are also not particularly sensitive to human-induced environmental degradation

Although the biological communities associated with cobble and sand beach areas are not very diverse, direct effects from toxic pollutants such as mortality could occur to Pacific sand crabs and other small crustaceans that represent an important food resource for shore birds and nearshore fishes and subsequently some marine mammals such as dolphins, which in turn feed on nearshore fishes. Several of these species are of ecological importance and are biologically significant in federal and state statutes and regulations, and are federal- and state-listed species. Indirect effects to shore birds and nearshore fishes could occur if the effects of degraded water quality are large enough to reduce their food source. Direct effects could occur if these organisms are directly exposed to sufficient quantities of toxic pollutants that have escaped into the natural habitat of these species, such as the intertidal beach and subtidal marine environment.

Impact BIO-7 is considered a significant impact because ecologically important and biologically significant species would be affected in the event of the runoff of significant

amounts of these pollutants into the marine environment. In its APMs (see Table 4-2, *Applicant-Proposed Measures*), SCE commits to updating existing plans. The following measures would ensure that impacts to marine habitat are minimized (see Table 2-5).

- **APM-1**: **Waste Management Program** (Section 4.1, *Hazardous and Radiological Materials*).
- **APM-12**: **Stormwater Pollution Prevention Plan (SWPPP)** (Section 4.9, *Hydrology and Water Quality*).
- **APM-17**: **Offshore Spill Response Plan** (Section 4.9, *Hydrology and Water Quality*).

With implementation of APM-1, APM-12, and APM-17, impacts related to degradation of habitat from polluted runoff would be reduced to a less-than-significant level.

Mitigation Measures

No MMs are recommended for Impact BIO-7.

Impact BIO-8: Risk of Oil Spill Mortality to Protected Marine Species.

The presence of vessels used for decommissioning activities could result in an oil or fuel spill **(Less than Significant).**

Impact Discussion

The increase in boat and ship traffic on the water associated with the disposition of SOF may result in an increase in the risk of oil and fuel spills. This could occur from fuel or hydraulic leaks on the vessels or equipment positioned on vessels or barges or during refueling if permitted onsite.

An oil spill could impact all the resources shown in Table 4.4-4. As the oil would tend to stay on the surface, intertidal and shallow subtidal habitats and associated biological communities would be at greatest risk, especially the cobble as the oil or fuel could penetrate into the interstices between the cobbles where it could persist for a long time and result in continued slow release of pollutants. Due to its location in the low intertidal and shallow subtidal, surfgrass would also be especially vulnerable.

Effects on subtidal communities would be less apparent, but kelp that forms canopies at or near the surface would be especially vulnerable as would seabirds, fishes, marine mammals, and sea turtles that occur in the upper water column and surface waters. Toxic components of the spill could spread to marine habitats and resources both due to ocean currents and through the food web, potentially bioaccumulating and affecting higher trophic level organisms such as fish, lobster and crab, marine mammals, and seabirds. Several of these are federally- or state-listed species, and their death due to an oil spill

would constitute "take" defined under the FESA and CESA. There is also a risk of spill from vessels transiting from the Proposed Project site to the locations where the materials removed during demolition would be disposed (e.g., Port of Long Beach [POLB]).

In its APMs (see Table 4-2, *Applicant-Proposed Measures*), SCE commits to the following measures to ensure that impacts to marine habitat would be minimized.

- **APM-17: Offshore Spill Response Plan** (Section 4.9, *Hydrology and Water Quality*).

While the consequence of a spill would result in the high likelihood of causing a substantial decline in local populations of listed species and a reduction in the quantity or quality of habitats such as nearshore surfgrass, the likelihood of a spill occurring is unlikely based on implementation of APM-17. Impacts would, therefore, be less than significant.

Mitigation Measures

No MMs are recommended for Impact BIO-8.

Impact BIO-9: Release of Hydrogen Sulfide (H_2S) Gas from Intake and Discharge Conduits.

Anaerobic water containing H_2S gas released from the intake and discharge conduits during decommissioning could cause mortality of marine organisms **(Less than Significant with Mitigation).**

Impact Discussion

The removal of the main and auxiliary intake structures, MAPS, and diffuser ports from each of the two discharge conduits would result in the release of water inside the conduits that could be anaerobic and could also release H_2S gas that may have formed inside the conduits after they are plugged at the forebay. The anaerobic conditions would result if the water inside the conduits has remained stagnant for a long time. The time it would take for anaerobic conditions to occur would vary depending on the water temperature, the amount of biological material in the water, and the level of biofouling growth (e.g., mussels and barnacles) on the conduits. Warmer ocean temperatures result in lower available oxygen for organisms, and any available oxygen in the water could be rapidly depleted if there is a high level of fouling in the conduits. The discharge conduit would remain in use until close to the time that removal of the structures would occur, but because the spent fuel pools no longer require ocean cooling, the intake conduit would have been stagnant for some time prior to the start of the Proposed Project. These possible anaerobic conditions provide an environment where sulfur-reducing bacteria

could result in the production of H_2S gas, and the likelihood for production of gas would increase the longer the conduits remain stagnant prior to the removal of the structures.

The release of the anaerobic water from the conduits during the removal of the structures has the potential to affect a wide range of organisms near the release and could cause immediate mortality to organisms that come into direct contact with the water when it is released due to the low levels of oxygen in the water. Indirect effects could include latent mortality of organisms or reduction in food resources for other organisms in the area. Any H_2S gas that formed in the system would rise to the surface, affecting any organisms that come in contact during the release, including marine mammals and sea turtles, and any humans working or recreating on the water's surface. The H_2S gas would also mix with the oxygen in the ambient water causing the precipitation of sulfur to the bottom, which could affect any benthic communities contacted.

Listed species potentially affected include several marine mammals and seabirds. Fishes and macroinvertebrates, such as crabs and lobster, may also be affected. If H_2S gas is released in the presence of a listed species such as a marine mammal or seabird, this could result in mortality due to inhalation and would constitute a "take" of a listed species. However, any release of H_2S gas is likely to occur very quickly (within minutes) and would not result in a prolonged disturbance to these species habitats. Because exposure to H_2S gas is potentially life-threatening, a release of H_2S gas has the potential to harm listed species. This would be considered a significant impact.

Mitigation Measures

Implementation of **MM BIO-9** would reduce the potential for impacts to listed species from H_2S gas release to a less-than-significant level.

MM BIO-9: Hydrogen Sulfide (H_2S) Gas Control Plan. Prior to accessing any enclosed spaces within the conduits, a qualified H_2S inspector, capable of assessing the level of risk from H_2S build up, shall undertake an H_2S Gas Risk Assessment, which may include ~~conduct~~ an inspection to determine if H_2S gas occurs at sufficient levels to pose a danger of release and subsequent mortality of listed marine species.

- If a desk-based Risk Assessment indicates a risk of H_2S build-up, an inspection shall be conducted. ~~the inspection confirms the presence of levels of H_2S gas sufficient to cause a risk to marine life in the area if released, the inspector shall develop and implement a H_2S Gas Control Plan as part of the detailed demolition planning. This H_2S Control Plan must allow for controlled safe removal/release of H_2S during the demolition activities.~~
- The Risk Assessment and any subsequent ~~P~~plan shall be provided for review to California State Lands Commission staff, California Coastal Commission staff, and other agencies as appropriate no less than 60 days prior to any conduit decommissioning work.

Impact BIO-10: Seabed Disturbance, Dredging, and Debris Accumulation.

Seabed disturbance during excavation, conduit and anchor block removal, and anchoring activities could cause destruction of marine habitat and mortality to marine organisms **(Less than Significant with Mitigation).**

Impact Discussion

Communities associated with vertical structures to be removed would be lost. However, these communities would not exist if it were not for the artificial structures; therefore, their removal has not been considered in this impact assessment.

~~Offshore conduit disposition work~~CSLC Lease Offshore Activities, includ~~ing~~e removal of vertical structures and buoys, would include minor dredging and debris removal, anchoring, and use of three to four temporary laydown areas on the seafloor within the CSLC lease area. The activities associated with the removal of vertical risers are anticipated to last approximately 4 months (COWI 2017). Based on the removal or reconfiguration of 45 structures (23 MAPS, two POIS, two AOIS, 12 diffuser risers, a fish return conduit opening, and five buoy anchors) during this approximate 4-month period (approximately 120 days), turbid conditions will likely occur at any one location for no more than 3 days.

To enable diver access to vertical structure cutting points, accumulated sediment and stone blanket material, which constitutes soft sediment habitat would be removed around each of the 39 vertical structures plus the fish return conduit. Material ~~will~~would be either removed and side-cast on the seabed within 15 to 20 feet of the excavation area by a long reach excavator, or suction dredged by divers operating a tethered hose and deposited within the discharge conduit. Removal of buoy anchors ~~will~~ would also result in the disturbance of a small amount (135 feet^3 and 12 meters^2) of soft sediment habitat. The volume of material removed or disturbed is expected to total 1,159 cubic yards and encompasses 1.075 acres of seabed. The largest volume of removed material at any one location is 229 cubic yards from an area of 0.43 acre, which is adjacent to each of the POIS. The seabed area affected varies in size according to the type of structure. (See Table 2-6, which presents estimated seabed disturbance areas and volumes).

The removal of the 39 vertical structures and the reconfiguration of the fish return conduit opening could result in increased turbidity during the excavation of seabed material and during cutting activities, and may also cover the adjacent seabed areas with debris that may be dropped during these activities. The increased turbidity in the offshore work area could result in reduced light levels for canopy kelp and surfgrass, which are HAPC. Direct effects from increased turbidity to these macrophytes may result in some decline in growth rates. Benthic habitats such as rocky reef communities, soft sediment infaunal communities, and seagrass beds may also become silted up or smothered as suspended material settles out of the water column. The removal and sidecasting is expected to be

sufficiently small in area relative to the amount of soft sediment habitat in the Proposed Project area that it would not constitute a substantial reduction in the quality or quantity of soft sediment habitat, which constitutes groundfish EFH, and is therefore less than significant and does not require mitigation. Within the submerged Proposed Project area (approximately 430 acres), 83 percent of the seabed consists of soft sediment habitat (approximately 357 acres). Therefore, the removal of seabed habitat constitutes just 0.3 percent of the available soft sediment seabed habitat near the Proposed Project.

Vertical structures are typically spaced at least 200 feet apart from one another. The further apart structures are, the less likely it becomes that turbid plume footprints generated at each structure would overlap and result in the exposure of habitats beyond approximately 3 days. Furthermore, the prevailing current in the area is alongshore; therefore, plumes generated by excavation and sidecasting at each structure are more likely to disperse perpendicular to the conduit corridor, generating discrete (as opposed to overlapping) turbid plume footprints. Therefore, turbid plumes generated by excavation and sidecasting at each structure would be less likely to affect overlapping areas of marine vegetation habitat (kelp and seagrasses). Surfgrass is a low intertidal to shallow subtidal species which in San Diego County is known to grow to depths of approximately 20 feet below MLLW (Stewart 1991). The only structures that are in proximity to surfgrass (Figure 4.4.-7) are the MAPS, which are located on the intake and discharge conduits inshore of the POIS and AOIS, and the fish return conduit opening. The POISs, AOISs, remaining MAPS, and diffusers are all located at distances greater than 500 meters from the nearest identified surfgrass and are at depths that are greater than the maximum depth of the species. Therefore, impacts to surfgrass from these vertical riser removals are not expected. The MAPS in proximity to surfgrass do not have stone blankets, so only approximately 0.06 acre would be disturbed, and approximately 60 cubic yards of sediment would be dredged around each MAPS location. Similarly, the fish return conduit work would only result in the disturbance of approximately 0.001 acre and dredging of 5 cubic yards of sediment. The low intertidal and shallow subtidal zone is a dynamic area subject to extensive periods of turbidity generated by wave action that are likely to occur for 3 days or more at a time, indicating the species can tolerate the periods of turbidity anticipated by the Proposed Project activities (i.e., approximately 3 days per structure). Given the dynamic nature of the area, impacts to surfgrass are not expected to occur from sedimentation or increased turbidity.

Canopy kelp is a perennial species that, once established, derives much of its light directly at the surface and therefore is less susceptible to turbidity than seagrasses and other types of submerged marine vegetation. Due to the short-term nature of the impact compared with several months of active growing season per year for both seagrasses and kelps, the turbidity generated during these activities would not likely result in a substantial reduction in the quality or quantity of these habitats.

In addition, notable turbid conditions are not anticipated to be generated during vessel positioning, the lifting of structures cut away from the conduit, or the attachment of structures to the conduit such as the marine mammal exclusion barriers. After cessation of seabed disturbance activities, turbid water conditions are expected to return to normal within a day or so as ocean currents (typically 1 to 2 feet per second at this location) will diffuse suspended sediment that has not settled out of the water column.

Marine mammals and sea turtles may be disturbed by the turbidity and be driven away from the area, which could be considered harassment and subsequently would qualify as "take" under FESA/CESA. In addition, if large debris is dropped during excavation, it could strike marine mammals or sea turtles that are near the work area, although this is considered highly unlikely. Instead, dropped debris is more likely to result in the direct mortality of benthic infaunal organisms and epifaunal fishes and invertebrates, if these organisms are struck or covered by the debris. However, this is also unlikely to occur unless there is an accident, such as a crane failure.

Fishes could also be affected by damage to gills and other body structures from increased turbidity. Sediments settling out of the water column could also affect intertidal and subtidal benthic habitat and associated biological communities. A reduction in foraging habitat, increased turbidity, and decreased water quality could also impact groundfishes, and pelagic fishes and the associated EFH. These effects could also indirectly affect commercial and recreational fishing (see Section 8.2. *Commercial Fishing*). Given the localized turbidity from removal of the vertical structures and the highly mobile nature of fish and commercially harvested invertebrate species, impacts on these species and habitat are likely to be less than significant. The impact would be further reduced with the inclusion of turbidity monitoring (APM-16).

Vessel anchoring can also result in impacts to the offshore area. Removal of vertical structures would require the use of a derrick barge with an estimated length of 200 to 250 feet, a beam of 50 to 65 feet, and a draft of between 3 to 6 feet (COWI 2017). This barge would use a four-point mooring system using four Stevin workboat anchors, each weighing approximately 15,500 pounds. The anchors would be connected to the barge using a 2.5-inch chain connected to buoys with 3-inch polypropylene line running from the buoys to the barge, which would be adjusted to reposition the barge during the work. The four-point mooring system would allow the derrick barge to move perpendicular to shore along the conduits, although movement parallel to shore would be limited. The crushing weight and scour damage associated with anchor placement on the seabed, and the movement of an anchor chain against the seabed, could result in the loss of seabed habitat including the two HAPCs (surfgrass and canopy kelp) and soft sediment communities that constitute groundfish EFH.

Although multiple mooring events are anticipated within groundfish EFH, the spatial extent of the effects would be small relative to the extensive amount of soft sediment

habitat which constitutes the existing groundfish EFH most susceptible to damage from this activity. Surfgrass is more susceptible to damage from anchoring, therefore, impacts to this habitat from anchors would be highly likely to result in a substantial reduction in the quality of EFH in the local area, resulting in a significant impact. Surfgrass is unlikely to occur deeper than -20 feet MLLW; therefore, impacts to surfgrass EFH due to anchor damage are most likely to occur during removal of the 13 MAPS that occur inshore of the POIS. Canopy kelp is secured to rocky reef and other hard substrate such as large boulders by the kelp's holdfast. Anchor damage could occur to holdfasts due to crushing by anchor placement and scour from the anchor chain. White abalone, which may occur at the deepest extent of the discharge conduits, could also be affected, if present. This impact can be mitigated by careful placement of the anchors and positioning based on the findings of a detailed survey of the areas proposed for placement of the anchors.

APMs proposed by SCE include turbidity monitoring to ensure that impacts to marine resources would be minimized. Seabed disturbance and subsequent turbidity would be spatially limited and occur over the approximate 4-month period noted above. In addition, waves and currents in the area would help to disperse the released sediment, thereby reducing the effects in any one area.

APM-9: Conduit Work Plan. The Applicant ~~and/~~or its contractor shall prepare a Conduit Work Plan, which shall fully describe the nature, structure, and sequence of activities comprising the approach to offshore conduit decommissioning work, including anchor positioning, dredge footprint, and side-casting footprints in relation to seabed habitat descriptions. Seabed habitat descriptions should include identification of biotic (vegetation type, species accounts, etc.) and abiotic (nature of the sediment/benthos, etc.) habitat character. The Plan shall include details regarding the vessels used to transport conduit components and debris, and the means and methods for the work activities related to the dispositioning of the offshore conduit components.

The Plan shall be submitted to California State Lands Commission staff for review and approval at least 60 days prior to start of offshore activities.

APM-15: Dredging Plan (Section 4.9, *Hydrology and Water Quality*).

APM-16: Turbidity Monitoring (Section 4.9, *Hydrology and Water Quality*).

Although fish, sea turtles, and marine mammals in the Proposed Project area are highly mobile and can avoid large debris, APM-9 and APM-15 would further reduce these localized and short-term effects to a less-than-significant level by requiring identification of habitat character in potential work areas, requiring avoidance of areas of sensitive habitat, and minimizing water quality impacts that could degrade marine habitat. APM-15 and APM-16 would reduce marine habitat and organism impacts due to turbidity.

Mitigation Measure

Soft sediment habitat containing infaunal assemblages and acting as groundfish EFH is abundant in the Proposed Project area; as anchoring would affect only a small proportion of soft sediment habitat in the area, it would not constitute a significant impact. Since surfgrass, kelp, and rocky reef habitats are less common in the area, any damage to these habitats, or protected species such as white abalone, due to anchor deployment would be a significant impact. Implementation of **MM BIO-10** would reduce potential impacts to a less-than-significant level.

MM BIO-10. Anchoring Plan. The Applicant or its contractor shall prepare an Anchoring Plan for the derrick barge and any other vessels requiring large or frequent anchoring. The Plan shall describe the offshore activities for which vessel anchoring is required, including anchoring arrangements, general procedures for deploying and recovering anchors, and identify the locations of any temporary laydown areas along with the process for avoiding hard substrate and sensitive marine areas (e.g., surfgrass). The Plan shall include:

- The positioning of large anchors used to moor the derrick barge to locations that avoid damage to the seabed, surfgrass, and canopy kelp habitat from both the anchors and mooring chains. If alternative anchor sites with no habitat cannot be identified, consultation with U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) shall be required prior to finalization of the Plan.
- Anchor positions shown within a spatial accuracy sufficient to allow comprehensive survey mapping of benthic habitats, particularly surfgrass and canopy kelp habitats by qualified SCUBA divers prior to anchoring. Mapping shall include stipe density counts, precise areal coverage, and associated flora and fauna. Surveys shall include special attention towards identifying the presence of abalone at the site. All abalone observed must be identified to species.
- Locations and size of temporary laydown areas that avoid damage to the seabed, surfgrass, and canopy kelp habitat, and measures to address the positioning of materials.
- Additional protective measures such as anchor deployment speeds (to avoid impacts to epifaunal fishes and invertebrates).
- A statement that surveys shall be repeated within 1 month after anchors have been removed to demonstrate areas are not affected by anchor damage or to evaluate/quantify the area that was affected for purposes of determining mitigation.

The Anchoring Plan shall be completed and submitted to USFWS, NMFS, and California State Lands Commission staffs for review and approval 60 days prior to start of offshore activities.

Impact BIO-11: Harassment of Marine Life.

Decommissioning activities would generate noise above and below the water surface that could result in disturbance of marine life. In addition, vessel traffic could result in inadvertent vessel collision with listed species **(Less than Significant with Mitigation).**

Impact Discussion

Potential impacts to marine mammals, sea turtles, and other marine life include inadvertent vessel collision with listed species and acoustic effects during decommissioning. Per the MMPA (Marine Mammal Commission 2016; see also Appendix F), harassment means any act of pursuit, torment, or annoyance that has the potential to injure a marine mammal or marine mammal stock in the wild (Level A harassment); or that has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering, but does not have the potential to injure a marine mammal or marine mammal stock in the wild (Level B harassment).

Vessel Collision

The Applicant's proposed final dispositioning of the SONGS Units 2 and 3 offshore conduits would require the use of one tugboat, derrick barge, workboat, crew boat, and materials barge (COWI 2017). Vertical structures removed during dispositioning of the offshore conduits would be placed on the seafloor near the work area and within the area covered by the CSLC lease (temporary laydown area). The debris would be marked with temporary buoys, as needed, then loaded onto a barge with a high-capacity crane for transport to the POLB, as was done for the SONGS Unit 1 conduit dispositioning. Although temporary, the activities associated with the use of various marine vessels could result in significant impacts to marine mammals and sea turtles.

Airborne and Underwater Noise

Offshore activities would also generate airborne and underwater noise that may disturb animals such as harbor seals and sea lions while they are on the surface during foraging or resting behaviors. No known haul-out sites occur in the area, although pinnipeds could occasionally use the beaches as haul-out locations and could be disturbed by surface-generated noise. Underwater noise would be generated from vessel engines, excavation, dredging, and side-casting operations, as well as from saw cutting various components (i.e., manhole access port structures, primary offshore intake structure, auxiliary offshore intake structure, and approximately 12 diffuser ports) with a diamond wire cutter. The Proposed Project schedule (Appendix A in COWI 2017) indicates offshore activities would take up to 5 months to complete, during which time underwater noise would be generated on an intermittent basis. The greatest underwater noise activity would be saw cutting activities. These noise-generating activities are likely to be intermittent and would only

occur during discrete periods of construction lasting several months. However, temporary increases in underwater noise levels caused by Project-related vessel traffic (e.g., crew and tug boats) and other decommissioning activities (e.g., dredging, and saw cutting) may potentially expose marine life to excessive underwater noise levels.

As described in Appendix F3, *Noise Impacts on Marine Wildlife*, noise from crew boats and tug boats during the Proposed Project would be limited to short durations, typically while transporting crews and equipment. On a daily basis, the total duration of both types of operating vessels would likely be less than 2 hours per day. Vessel noise is a combination of narrowband tones at specific frequencies and broadband noise, which are roughly related to a vessel's size and speed. For vessels the approximate size of crew and supply boats, tones dominate up to about 50 hertz (Hz). Broadband components may extend up to 100 kilohertz (kHz), but they peak much lower, at between 50 and 150 Hz. Richardson et al. (1995) summarized noise from similar vessels that would be used for the Proposed Project, providing an estimated underwater source level of 156 decibels (dB) referenced to (re) 1 micropascal (µPa) root-mean-square (RMS or dB_{rms}) for a 53-foot-long crew boat at 52 feet and 159 dB_{rms} for a 112-foot-long twin diesel at 112 feet.[38]

Excavation or dredging of the surrounding seabed would be required to gain access to the structures to be removed from the conduits. After excavation/dredging is complete, a diamond wire cutter would be used to saw through the structures to remove them from the large conduits. The current schedule anticipates up to 5 months of activity to complete the removal of the SOF, including dredging and cutting activities. Typical dredging noise levels are lower than or comparable to those from large vessels at 145 dB_{rms} to 190 dB_{rms} (Department for Environment, Food, and Rural Affairs–Centre for Environment, Fisheries & Aquaculture Science 2009; Table 3). As described in Section 4.11, *Noise*, and Appendix F3, underwater noise levels expected to occur during saw cutting are anticipated to range from 150.1 dB_{peak}[39] to 159.2 dB_{peak}, and 145.6 dB_{rms} to 155.4 dB_{rms} (90% RMS), depending on the metric used, at 50 feet from the source.

When analyzing the auditory effects of noise exposure, noise is categorized as either being impulsive (high peak sound pressure, short duration, fast rise time, and broad frequency content) or non-impulsive (steady-state). For example, sonars, vessel engines, and vibratory pile drivers are non-impulsive noise sources, while explosives, impact pile drivers, and airguns are treated as impulsive noise sources. Thus, sound generated by vessel engines, excavation, dredging, and side-casting activities, as well as saw cutting, would create non-impulsive, continuous noise. ==Marine species generally have lower thresholds for auditory damage associated with impulsive noise than non-impulsive noise. Impacts to marine wildlife from noise are generally defined as those causing permanent,

[38] 1 µPa is the reference sound pressure for sound in water. Root-mean-square (rms) sound pressure is the average of the squared sound pressure over some duration.

[39] Peak sound pressure is the maximum absolute value of the instantaneous sound pressure during a specified time interval.

irreversible hearing loss and loss of hearing sensitivity (permanent threshold shifts [PTS]); temporary, reversible hearing loss and loss of hearing sensitivity (temporary threshold shifts [TTS]); and behavioral disruption (e.g., avoidance, vocalization changes), which could lead to indirect effects (e.g., reduced foraging success).

Acoustic threshold criteria (received sound level) have been developed for various marine taxa above which individuals are predicted to experience changes in their hearing sensitivity, either PTS or TTS, or behavior (see Appendix F3). Under the MMPA, PTS is considered Level A harassment (considered harm in FESA), while TTS and behavioral disruption are considered Level B harassment (considered harassment in FESA). Level A harassment due to PTS injuries to marine mammals or sea turtles from project noise is unlikely to occur during the Proposed Project. While underwater PTS thresholds may be exceeded up to 27 meters (88 feet) from the noisiest activities (vessel operation, see Appendix F3), the exceedance levels for noisy activities occur close enough to the activities that marine mammals and sea turtles would not likely be exposed to these noise levels. California sea lions and harbor seals would be most likely to be exposed to PTS thresholds because of their curious nature. For example, vessel operation within 16.5 meters (54 feet) of these animals may result in PTS. However, these animals are highly mobile relative to the distances over which these cumulative PTS thresholds are exceeded. All marine mammals and sea turtles that could be exposed to PTS thresholds are expected and able to move away from noisy activities if they experience discomfort or distress and therefore are unlikely to be subject to cumulative exposure levels sufficient to result in PTS. This scenario would constitute a Level B, but not a Level A, harassment.

The Proposed Project area includes several listed and special-status marine mammal species afforded special protections under the MMPA, FESA, and CESA. These include nearshore populations of California sea lions, short- and long-beaked common dolphins, bottlenose dolphins, and Risso's dolphins. Gray whales are not likely to be observed in the area; however, they migrate close to shore and could interact with the Proposed Project. Additionally, sea turtles, while considered rare in the Proposed Project area, are protected under the FESA (green sea turtles have the potential to occur in the Proposed Project area and are SSC) and are also vulnerable to noise-related impacts.

Sound levels from vessel activity could exceed National Oceanic and Atmospheric Administration (NOAA) underwater acoustic thresholds for non-impulsive, continuous noise (120 dBrms; threshold used for marine mammals, and for sea turtles in the absence of formal criteria (NMFS 2018m); see Appendix F3, *Boat Operations* for description of likely noise levels from a 112-foot twin diesel boat. However, noise generated by supply/crew vessels would be similar to noise generated by other vessels that routinely transit the water's surface. Any increase in ambient noise levels due to Proposed Project activities would result in a minor increase noise levels sufficient for disturbing marine mammals and sea turtles. Noise from vessel traffic would be comparable to noise-generating activities in other the coastal areas were marine mammals co-occur; therefore,

this impact would be less than significant. Concrete saw cutting would generate additional underwater noise during removal of the SOF. The 120 dBrms threshold for underwater acoustic noise is expected to be exceeded by saw cutting up to 1,560 feet from the concrete cutting source based on the best available information (see Appendix F3).

Acoustic monitoring is a common practice in California for addressing noise impacts from marine activities. Typically, an authorization permit for potential harassment of marine mammals is required following consultation with NMFS and USFWS. During consultation, detailed information is required to ascertain the timing and type of work activities that would impact the behavior of marine mammals. Data from acoustic monitoring devices installed before and during construction activities are then used to establish Level B behavioral harassment zones of influence where received underwater sound pressure levels (SPLs) are higher than 160 dB_{rms} and 120 dB_{rms} for impulsive noise sources (e.g., impact pile driving) and non-impulsive noise sources (e.g., vibratory pile driving, mechanic dismantling), respectively (see Appendix F3~~2~~). These zones are used by marine mammal observers (MMOs) in determining whether stop work procedures need to be implemented for marine mammals and sea turtles active in the area. MMOs have the authority to halt activities with the potential to generate high-amplitude impulse or continuous noise when sensitive species are near noisy activities, allowing sensitive species time to depart the area under reasonably natural behavior. Should marine mammals occur within this area during these activities, there is potential for disturbance, which would constitute a Level B harassment scenario. Under this scenario, this impact would be considered significant, requiring mitigation to reduce the impact to less than significant.

Other wildlife may also be affected by an increase in underwater noise, including both benthic- and pelagic-associated fishes. Sedentary fishes, particularly those associated seabed features such as the adjacent kelp and rock reef features near the conduits, are likely to be more vulnerable to general disturbance and noise because their habitat is more restricted than sandy seabed habitat, which dominates the broader nearshore areas. Airborne noise is unlikely to cause any disturbance to fishes, as sound does not penetrate well through the interface between the sea surface and air.

Seabirds may also be disturbed from their natural foraging and resting activities due to Proposed Project-related offshore activities; however, seabirds are highly mobile, and would be able to adjust to the direct, short-term effects of noise-generating activities by moving their foraging and resting behaviors to other locations. Habitat for these activities is not limited exclusively to the zone of direct impact, and is easily accessible to seabirds that would otherwise be in the area during the period of Proposed Project activities. Therefore, no significant direct or indirect effects are expected for seabirds.

Without mitigation, impacts due to inadvertent vessel collision with listed species and underwater noise levels would be considered a significant impact as marine species could be directly affected. In the case of vessel collision, although unlikely, mortality could

result. Direct effects such as mortality are unlikely due to Proposed Project-related noise; however, disturbance of typical behavior could itself be considered a direct effect and may result in indirect effects, including reduced foraging success.

Mitigation Measure

Implementation of **MM BIO-11** would reduce impacts to sensitive species to a less-than-significant level.

MM BIO-11: Marine Mammal and Sea Turtle Mitigation and Monitoring Plan. The Applicant or its contractor shall prepare a Marine Mammal and Sea Turtle Mitigation and Monitoring Plan. The purpose of the Plan is to ensure that no harassment of marine mammals or other marine life occurs during Proposed Project activities. The Plan, which may be a part of a National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS) consultation under the Marine Mammal Protection Act, shall include:

- A description of the work activities including vessel size, activity types and locations, and Proposed Project timeframes.
- A risk analysis (likelihood and consequence) of noise effects to marine mammals and sea turtles based on the most recent activity plans.
- The qualifications, number, location, and roles/authority of dedicated marine wildlife observers (MMOs). A minimum of two MMOs, approved by California State Lands Commission (CSLC) and NMFS staffs, shall be placed on major support vessels.
- The distance, speed, and direction transiting vessels shall maintain when in proximity to a marine mammal or turtle, as follows:
    - Vessel operators shall make every effort to maintain a distance of at least 300 feet from sighted whales, and 150 feet or greater from sea turtles or smaller cetaceans whenever possible.
    - When small cetaceans are sighted while a vessel is underway (e.g., bow-riding), vessel operators shall attempt to remain parallel to the animal's course. When paralleling whales, vessels shall operate at a constant speed that is not faster than the whales' and shall avoid excessive speed or abrupt changes in direction until the cetacean has left the area.
    - Per NMFS recommendations, and when safety permits (i.e., excluding during poor sea and weather conditions, thereby ensuring safe vessel maneuverability under those special conditions), vessel speeds shall not exceed 11.5 miles per hour (10 knots) when mother/calf pairs, groups, or large assemblages of cetaceans (greater than five individuals) are observed near an underway vessel. A single cetacean at the surface may indicate the presence of submerged animals in the vicinity; therefore, prudent precautionary measures, such as decreasing speed and avoiding sudden changes in direction, should always be exercised. The vessel shall route around the animals, maintaining a minimum distance of 300 feet. Whales may surface in unpredictable locations or approach slowly

moving vessels. When an animal is sighted in the vessel's path or in close proximity to a moving vessel and when safety permits, operators shall reduce speed and shift the engine to neutral. Vessel operators shall not engage the engines until the animals are clear of the area.

- o Support vessels (i.e., barge tows) shall not cross directly in front of migrating whales, other threatened or endangered marine mammals, or sea turtles.
- o Vessels shall not separate female whales from their calves or herd or drive whales. If a whale engages in evasive or defensive action, support vessels shall drop back until the animal moves out of the area.

- Observation recording procedures and reporting requirements in the event of an observed impact to marine wildlife. Collisions with marine wildlife shall be reported promptly to the federal and state agencies listed below pursuant to each agency's reporting procedures.

National Marine Fisheries Service
Southwest Region Stranding Coordinator
Long Beach, CA 90802
Phone: (562) 980-3230 or (562) 506-4315 (24-hour cell)

California State Lands Commission
Mineral Resources Management Division
Long Beach, CA 90802
Phone: (562) 590-5201

- An acoustic monitoring strategy. If underwater sound pressure levels are thought to exceed limits established by NMFS, a marine acoustics specialist shall install acoustic monitoring devices before saw cutting occurs to monitor and establish Level B behavioral harassment zones, which shall be enforced by qualified marine wildlife observers. <u>The strategy shall also include the pausing of activities that generate sufficient noise to exceed limits established by NMFS while vulnerable marine organisms are in the established harassment zones.</u>

This mitigation is subject to NMFS and USFWS consultation. The Plan shall be submitted to CSLC staff a minimum of 30 days prior to the implementation of offshore work.

Impact BIO-12: Spread of Invasive and Non-Native Marine Species.

Vessels used during decommissioning activities could introduce invasive non-native marine species **(Less than Significant with Mitigation).**

Impact Discussion

Work boats would be needed to remove the main and auxiliary intake structures, the MAPS, and diffuser ports from the two discharge conduits. Many invasive non-native aquatic species (NAS) are introduced by boat traffic, either as encrusting organisms on the hulls and other submerged parts of vessels, or when ballast water is discharged from

vessels. The introduction of NAS can result in permanent changes in the community composition or ecosystem relationships among species that are recognized for scientific, recreational, ecological, or commercial importance and permanent alteration or destruction of habitat that precludes reestablishment of native biological populations.

Ports and harbors and adjacent areas are typically vulnerable to invasive species, as the bulk of marine traffic is concentrated at these sites. The Los Angeles/Long Beach harbor complex is proposed as a location for transporting material removed during the Proposed Project. Workboat and crew boat journeys are also expected between the site and the smaller Oceanside or Dana Point harbors. If NAS are resident within any of these harbor facilities, NAS could be transported from the harbor back to the conduit location during the transit to and from the port facility and the conduit location. However, transfer is highly unlikely as the vessels are not expected to remain within the harbor for a sufficient length of time for NAS to establish on the hulls. Ballast water discharge and recharge are strictly controlled within major harbors for large vessels, and therefore this vector is also an unlikely source for NAS transfer from the harbor to the Proposed Project site. Prior to beginning work at the conduit location, the vessels may be wet docked in harbors or ports.

Mitigation Measure

The transfer of NAS between potential NAS hotspots, such as harbor facilities, and the Proposed Project location is unlikely; however, with the inclusion of **MM BIO-12**, the impact would be less than significant.

MM BIO-12: Invasive Non-Native Aquatic Species (NAS). To prevent the introduction of NAS, all Proposed Project vessels shall:

- Originate from Oceanside Harbor, the Ports of Long Beach/Los Angeles, Dana Point Harbor, or San Diego Bay and be continuously based out of Oceanside Harbor, the Ports of Long Beach/Los Angeles, Dana Point Harbor, or San Diego Bay since last dry docking or have underwater surfaces cleaned before entering southern California at vessel origination point and immediately prior to transiting to the Project site.
- Be managed consistent with California State Lands Commission (CSLC) Ballast Management Regulations regardless of vessel size. Biofouling Removal and Hull Husbandry Reporting Forms shall be submitted to CSLC staff.
- Proposed Project vessels shall be available for inspection by CSLC staff for compliance. Further, as part of the Project kickoff meeting, a qualified marine biologist, approved by CSLC staff, shall provide information to all Project personnel about the spread of NAS in California waters and the programs that will be implemented to minimize this hazard (CSLC Ballast Water Management Program and Biofouling Removal and Hull Husbandry Reporting).

4.4.6 Cumulative Impacts

As discussed in Section 3.2, *Relevant Cumulative Projects*, and shown in Table 3-2, 17 reasonably foreseeable cumulative projects fall within the geographic area near SONGS considered for potential cumulative impacts related to biological resources. Specific projects that fall within the study area for terrestrial biological resources include the Approved ISFSI ~~expansion~~, the Mesa Environmental Investigation and Remediation, and the Riprap and Public Access Walkway and Repairs (see Section 3.2.1, *SONGS Independent Spent Fuel Storage Installation ~~Expansion~~*, and Cumulative Projects ID Nos. 1, 2, and 5 in Table 3-2). Project impacts to terrestrial biological resources are minimal and limited in extent. The Proposed Project would not result in new construction, but rather the removal of structures and hardscape with the revegetation of soils exposed by demolition. Indirect effects from the Proposed Project, including dust, noise, and human disturbance, could overlap with one or more of the cumulative projects in the immediate vicinity. However, MMs BIO-1c and AQ-3b would minimize or avoid indirect impacts to terrestrial biological resources. Therefore, the Proposed Project's potential contribution to cumulative impacts on terrestrial biological resources would not be cumulatively considerable.

From a marine biological resource's perspective, none of the cumulative projects in Table 3-2 are immediately offshore of the Proposed Project. Expansion of Wheeler North Reef (see Section 3.2.3, *Wheeler North Reef Expansion*, and Cumulative Projects ID No. 45 in Table 3-2), which SCE constructed to mitigate the effects of the operation of the SONGS intake and discharge system, might increase activity in the general Proposed Project vicinity. The reef consists of approximately 126,000 tons of low-profile (~3 feet), boulder-sized, quarry rock distributed on the seafloor over a total area of 174.4 acres (Reed et al. 2017, Coastal Environments, Inc. 2017a). The current reef extends from just offshore of the San Clemente Pier down-coast for approximately 6,500 feet. The closest reef modules on the existing reef are approximately 3 miles up-coast from SONGS.

Pre-engineering surveys and design for the reef expansion are scheduled to be completed in 2017 and construction is scheduled to take place in 2020 (SCE 2016a). The work for this project would likely be similar to the existing reef and involve placement of quarry rock on the bottom. The construction is likely to result in an increase in boat activity during construction. Areas near construction may be closed to recreational and commercial fishing and other recreational activities. Although there would likely be other impacts during construction, the distance of the Wheeler North Reef project from the Proposed Project would limit the cumulative effects. The only impacts that could represent cumulative impacts to marine biological resources, if they occurred at the same time as the activities associated with the Proposed Project, would be the increase in boat activity and effects on fishing and recreational activities.

Other identified marine projects such as the Palos Verdes Reef Restoration Project, the Doheny Ocean Desalination Plant Project, and the Seawater Desalination Project in Huntington Beach (see Sections 3.2.4 through 3.2.7, as well as Cumulative Projects ID Nos. 46, 47, and 52 in Table 3-2) are too far from the area of the Proposed Project to result in any cumulative impacts.

4.4.7 Future Activities

4.4.7.1 Terrestrial Biological Resources

Implementation of Future Activities could result in impacts to terrestrial biological resources that are similar to those discussed for the Proposed Project. Operation and maintenance of the Approved ISFSI would not affect terrestrial biological resources above baseline conditions. If the SNF has not been taken off site by 2035, the CCC may determine that the Approved ISFSI needs to be moved, assuming a permanent repository or interim storage facility is available. Final site restoration activities are contingent on removal of the Approved ISFSI and would conclude with any activities needed for final NRC license termination. The Applicant assumes that all SNF would be shipped off site by 2049. At that point, as part of decommissioning, the Approved ISFSI would be dismantled and the seawall, public beach access walkway, and riprap, which are structurally inter-related, would be dispositioned.

Depending on the requirements of future approvals, Future Activities could have similar impacts to terrestrial biological resources as the Proposed Project, as the Approved ISFSI is removed and final site restoration occurs. However, at this time the significance of these impacts cannot be determined without speculation. If impacts from Future Activities are found to be significant, implementation of measures similar to those recommended in Section 4.4.6, *Environmental Impact Analysis and Mitigation*, may be appropriate.

4.4.7.2 Marine Biological Resources

Future Activities would include removal of the temporary solid covers from the mammal exclusion barrier on the Unit 2 discharge conduit, which would then allow sand/sediment to enter the conduit. If required by the Commission, the remaining discharge conduit diffuser ports would also be removed, and the openings covered with solid covers. Removal of the Unit 2 covers, and the remaining diffuser ports may require dredging/excavation to remove accumulated sediment (see Figures 2-7 through 2-12), which would be side-cast or pumped into the Unit 2 and Unit 3 discharge conduits, similar to what would be done for the Proposed Project. As described for the Proposed Project, these activities would result in seabed disturbance (Impact BIO-10), which could degrade marine habitat, and the potential for oil spills (Impact BIO-8), harassment of marine life (Impact BIO-11), and the spread of invasive and non-native species (Impact BIO-12). However, the effects would be much less than the Proposed Project, all of which were less than significant with implementation of APMs.

Future removal of the seawall and shoreline riprap could also result in certain indirect impacts on marine resources. These impacts would be similar to those associated with the Proposed Project, such as Impacts BIO-10 and BIO-11.

Additionally, shore-based decommissioning activities associated with the removal of the seawall and shoreline riprap could result in impacts to sand and cobble beach habitat and any associated biological communities, including surfgrass which occurs in the low intertidal and shallow subtidal. Impacts could also occur to groundfishes, pelagic fishes, and associated EFH from disturbance to habitat, which could result in a reduction in prey. Seabirds that graze the intertidal beach zone, such as marbled godwit or sanderling, are likely to be intermittently displaced (short term) due to the direct effects of noise in this area. These birds are likely to move to areas up and down the beach, away from the activities that would otherwise disturb their natural grazing behavior.

4.4.8 Summary of Proposed Mitigation Measures

Table 4.4-5 provides a summary of the mitigation and Applicant-proposed measures.

Table 4.4-5. Biological Resources Impact/Mitigation Summary

Impact	MM/APM
BIO-1: Contribute to the Loss and Degradation of Sensitive Habitat	APM-4: Dust Suppression APM-12: Stormwater Pollution Prevention Plan (SWPPP) MM BIO-1a: Worker Environmental Awareness Program MM BIO-1b: ~~Habitat Restoration and Revegetation Plan~~ Weed Management MM BIO-1c: Rare Plant Surveys
BIO-2: Adversely Affect Terrestrial Special-Status Species	APM-4: Dust Suppression. APM-8: Nesting Bird Deterrents. APM-12: Stormwater Pollution Prevention Plan (SWPPP) MM BIO-1a: Worker Environmental Awareness Program MM BIO-1b: ~~Habitat Restoration and Revegetation Plan~~Weed Management MM BIO-2a: Special-Status Reptiles and Amphibians MM BIO-2b: Surveys and Monitoring for ~~Breeding~~ Nesting Birds MM BIO-2c: Burrowing Owl MM BIO-2d: Western Snowy Plover/California Least Tern MM BIO-2e: Coastal California Gnatcatcher MM BIO-2f: Noise Minimization Plan
BIO-3: Disturb Non-Listed Roosting or Breeding Bats	MM BIO-3: Sensitive Bats Species
BIO-4: Modify Potential Onshore U.S./ Waters of the State	MM BIO-4: Potential Waters of the U.S./State
BIO-5: Interfere with Established Native Resident or Migratory Wildlife Corridors	None recommended

Table 4.4-5. Biological Resources Impact/Mitigation Summary

Impact	MM/APM
BIO-6: Conflict with Adopted Conservation Plans	APM-4: Dust Suppression APM-8: Nesting Bird Deterrents APM-12: Stormwater Pollution Prevention Plan (SWPPP) MM BIO-1a: Worker Environmental Awareness Program MM BIO-1b: ~~Habitat Restoration and Revegetation Plan~~Weed Management MM BIO-2a: Special-Status Reptiles and Amphibians. MM BIO-2b: Surveys and Monitoring for ~~Breeding~~ Nesting Birds MM BIO-2c: Burrowing Owl MM BIO-2d: Western Snowy Plover/California Least Tern MM BIO-2e: Coastal California Gnatcatcher MM BIO-2f: Noise Minimization Plan MM BIO-4: Potential Waters of the U.S./State
BIO-7: Contribute to the Degradation of Marine Habitats	APM-1: Waste Management Program APM-12: Stormwater Pollution Prevention Plan (SWPPP) APM-17: Offshore Spill Response Plan
BIO-8: Risk of Oil Spill Mortality to Protected Marine Species	APM-17: Offshore Spill Response Plan
BIO-9: Release of H_2S Gas from Intake and Discharge Conduits	MM BIO-9: Hydrogen Sulfide (H_2S) Gas Control Plan
BIO-10: Seabed Disturbance, Dredging, and Debris Accumulation	APM-9: Conduit Work Plan APM-15: Dredging Plan APM-16: Turbidity Monitoring MM BIO-10: Anchoring Plan
BIO-11: Harassment of Marine Life	MM BIO-11: Marine Mammal and Sea Turtle Mitigation and Monitoring Plan
BIO-12: Spread of Invasive and Non-Native Marine Species	MM BIO-12: Invasive Non-Native Aquatic Species (NAS)

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4.5 CULTURAL AND PALEONTOLOGICAL RESOURCES

This section identifies cultural, historical, and paleontological resources in the Proposed Project area, identifies applicable significance thresholds, assesses the Proposed Project's impacts to these resources and their significance, and recommends measures to avoid or substantially reduce any effects found to be potentially significant. Project-related physical improvements are limited to the onshore San Onofre Nuclear Generating Station (SONGS) site, and an area directly offshore of SONGS. See Section 4.6, *Cultural Resources - Tribal*, for a discussion on cultural resources potentially of importance to California Native American Tribes.

Historical resources are defined as historic-period buildings, structures, facilities, districts, and objects; or archaeological sites and districts dating from either the precontact (previously referred to as prehistoric or historic period. Historical resources may be structures still in use, those that are abandoned, standing above ground, preserved on the ground surface, buried beneath the ground surface, or submerged under rivers, lakes, or the ocean. Paleontological resources, or fossils, are the evidence of once-living organisms preserved in the rock record. They include both the fossilized remains of ancient plants and animals and the traces thereof (e.g., trackways, imprints, burrows, etc.). In general, fossils are considered to be greater than 5,000 years old (Middle Holocene) and are typically preserved in sedimentary rocks. Although rare, fossils can also be preserved in volcanic rocks and low-grade metamorphic rocks under certain conditions (Society of Vertebrate Paleontology [SVP] 2010).

This section summarizes the cultural and paleontological setting of the Project area to provide context for assessment of archaeological and historical sites. The environmental setting is based on information obtained from the Proposed Project description, recent technical studies, and review of the cultural resources report, "Archaeological Survey Report for the Southern California Edison Company for the San Onofre Nuclear Generating Station, Parcels 5, 6, and 7, IO# 330002, San Diego County, California" (McLean 2014), which also includes the results of a cultural resources literature and records search completed by McLean at the California Historical Resources Information System's (CHRIS) South Coastal Information Center (SCIC) in 2014 (provided in Appendix G of this EIR). In addition, the California State Lands Commission (CSLC) Shipwrecks Database was consulted on April 10, 2017.

4.5.1 Environmental Setting

The area of potential effect (APE) is approximately 120 acres (99 acres onshore and 21 acres offshore) and includes the onshore SONGS site, two buried intake and discharge conduits along with a fish return conduit that extend from the power plant into the Pacific Ocean, and the area of disturbance from disposition activities. The APE is located within diverse ecological settings that include terrestrial and marine ecosystems.

The onshore region consists of coastal mesas, lowlands, and foothills that are separated by numerous alluvial drainages. Major drainages near the Proposed Project site include San Onofre Creek and San Mateo Creek to the northwest of the Proposed Project area, with Las Pulgas Creek and Aliso Canyon to the southeast (Stringer-Bowsher and Killoren 2013). These drainages provided freshwater and a variety of terrestrial food resources, both plant and animal. The abundance and availability of these critical food and water resources is evident in archaeological studies that reveal nearly 10,000 years of Native American occupation in the region, and historic populations that depended on the coastal/foothill landscape during early development of the San Diego historic livestock industry. The Proposed Project is located on a coastal terrace at the lower reaches of Horno Canyon. Flora is dominated by a coastal sage scrub plant community, while chaparral is found along bluffs. The area was significantly altered to construct SONGS, with only the bluffs at the western boundary remaining undisturbed by human activity. However, the bluffs have been significantly altered by ongoing natural processes (e.g., bluff erosion) marked by preceptory runoff and sea inundation (Isham 1973). Historic photos and site assessments document the prior excavation activities that occurred during the initial construction of SONGS, which resulted in soil disturbance of at least 70 feet below the original grade across the Onshore Site.

The offshore Proposed Project area consists of approximately 21 acres and begins at the shoreline where two intake/discharge conduits extend a maximum of 1.6 miles past the littoral zone into the open ocean. Climate change has shaped and altered the ~~prehistoric~~ precontact and modern human experience in coastal regions (Moratto 1984). Important changes include fluctuations in sea surface temperature over millennia and the effects of El Niño-Southern Oscillation (ENSO) on sediment deposition and wave energy that has caused erosion to shorelines. In addition, the geological setting of the Proposed Project area is marked by dynamic tectonic processes that have continued to shape the ocean basins and adjacent land masses. In the broader San Diego County region, archaeological evidence of ENSO patterns measured by sediment flux over time has revealed that lagoon closure and the development of sandy beaches occurred approximately 5,000 years ago (Masters and Aiello 2007). During the Late Period (approximately 1,300 to 800 years before present [BP]) environmental changes affected the availability of rocky kelp environments that provided fish and other marine mammal food sources, and sandy beaches that provided abundant shellfish food resources varied. The presence/absence of these resource environments over time had significant implications for the lived experiences of ~~prehistoric~~ the indigenous hunters, gatherers, and fishers that once occupied the region.

In addition, studies of mean sea level over time indicate that the ~~prehistoric~~ precontact shoreline of the Proposed Project area was likely 0.5 mile to 1 mile farther out than is observed today (Isham 1973; Masters and Aiello 2007). The inundation of the Pacific coastline due to rising sea levels has resulted in the submergence of key archaeological sites that yield evidence of the earliest human occupations of coastal North America

(Moratto 1984). Indeed, there are over 30 recorded coastal sites in California dating to between 9,500 to 8,000 radiocarbon BP, and 10 submerged ~~prehistoric~~ precontact sites identified within the San Diego County region (ICF International et al. 2013; Erlandson 2004).

4.5.1.1 ~~Prehistory~~ Precontact History of San Diego County

The ~~prehistoric~~ occupation of San Diego County by Native American communities extends to at least 10,000 BP and has a complex culture history. There are over a dozen ~~prehistoric~~ precontact cultural chronologies that have been published since the 1970s. Of these, culture sequences by Rogers (1945) and Wallace (1955) are most frequently used in northern San Diego County and within the area surrounding the Proposed Project.

A summary of key changes in cultural patterns occurring throughout human history in the region surrounding the Proposed Project area is provided below. The following terms are used to describe changes to cultural patterns within the northern San Diego County coastal region: Paleoindian, Archaic, and Late Precontact (previously referred to as Prehistoric).

Paleoindian Period (11,500 BP to 8,500/7,500 BP)

The Paleoindian Period begins with the Clovis era, occurring in San Diego County as early as 11,200 BP and concluding between 8,500 BP and 7,500 BP during the geological periods known as the terminal Pleistocene and early Holocene. Clovis sites within northern San Diego County are characterized by isolated fluted points; however, to date there have been no Clovis sites or isolated finds within the coastal area immediately surrounding the Proposed Project. Evidence of human occupation during this period consists of artifact assemblages containing stone tools (e.g., scrapers, knives, and rare crescent-shaped tools). Archaeological deposits are marked by the distinct absence of groundstone tools, a narrower range of consumed food resources relative to the Archaic period, and stratigraphic superposition below Archaic period deposits.

There is continued debate among researchers of San Diego County whom maintain two dominant interpretations of archaeological patterns during this period: (a) Paleoindians were highly specialized in hunting strategies, and as a result, maintained high mobility and short-term habitation areas; and (b) archaeological sites containing only stone tool assemblages are part of a generalized hunting and gathering adaptation that includes expedient hunting and food processing locales, as well as multi-seasonal habitation areas that exhibit a more diverse range of technological tools reflective of a broader range of human activities at centralized habitation areas.

Archaic (8,500 BP to 1,300/800 BP)

The Archaic period extends from 8,500 BP, and possibly as early as 9,000 BP, and continues until 1,300 BP or 800 BP (Moratto 1984). Coastal Archaic sites (often termed the La Jolla complex) are characterized by expansive shell deposits containing flaked cobble tools, groundstone, and discoids (a type of stone tool). Coastal sites dating to this period were seasonally occupied and exhibit food gathering activities with a strong focus on procuring marine resources within shoreline and intertidal environments, such as mollusks (e.g., clams, oysters, scallops, and snails) and fish, as well as an expansion of diet to include terrestrial plant resources, such as Torrey pine nuts and other seeds.

Between 4,000 BP and 3,000 BP a major environmental change occurred where estuaries and lagoons throughout Southern California became subject to extensive silting. The resulting effects on the natural environment in the region included a sudden severe decline in shellfish resources and lack of fresh water, which led to the abandonment of many coastal areas. However, archaeological evidence from nearby Camp Pendleton suggests that occupation along the northern San Diego County coastline near the Proposed Project area may have continued unabated. Continuity of human settlement is represented by large, thick middens that show evidence of use in multiple seasons, suggesting flexible and dynamic food procurement strategies through time.

Late ~~Prehistoric~~ Precontact (1,300/800 BP to 200 BP)

In San Diego County, the Late ~~Prehistoric~~ Precontact period occurred during the late Holocene, beginning between 1,300 BP and 800 BP, and concluded in 200 BP, or in A.D. 1769 more precisely, at the time of European contact. Two distinct linguistic groups and related culture complexes are documented during this period for the County, including the Shoshonean language group of the Cuyamaca to the south and the Uto-Aztecan language group of the Luiseño/Juaneño culture to the north. The following discussion focuses on the northern linguistic group that occupied the region surrounding the Proposed Project area.

In general, Late ~~Prehistoric~~ Precontact culture patterns are marked by the emergence of two important technological advancements: small, pressure-flaked projectile points that indicate the use of bow and arrow technology and related hunting strategies, as well as the appearance of ceramics and related food storage and processing techniques. Other changes in cultural patterns include a shift in burial practices away from flexed burials towards the use of cremations, and an emphasis on inland nut, seed, and plant food processing. Intensification of acorn nut processing dominates food collection activities and suggests important changes to social structure and seasonal habitation patterns.

In northern San Diego County, Late ~~Prehistoric~~ Precontact culture patterns have been classified as belonging to the San Luis Rey complex (Meighan 1954). Archaeological evidence from this period falls within two broad phases occurring over time, San Luis Rey

I and II. The San Luis I phase is represented by archaeological deposits that have an absence of pottery, while San Luis Rey II deposits contain pottery. In comparison to the Cuyamaca culture complex that exists in southern San Diego County, San Luis Rey Phase I and II archaeological deposits demonstrate lower frequencies of side-notched projectile points, flaked stone tools, ceramics, and milling stone tools. These deposits also contain less diverse ceramic vessel forms. Other important Late ~~Prehistoric~~ Precontact patterns are related to changes in seasonal settlement patterns, where sedentary, permanent winter villages and camps appear in the foothills, with sedentary summer camps being established in mountain settings. Highland settlements also occur, where milling stations located at bedrock outcrops facilitated a seasonal gathering and processing of acorn nuts and other food resources.

Dominant cultural patterns remain in the area surrounding the Proposed Project, consistent with the intensive exploitation of littoral resources of the Archaic period. Likewise, researchers argue for the continuance of Late ~~Prehistoric~~ Precontact culture patterns into the modern ethnohistoric post-contact era.

Ethnohistory

The establishment of the Mission San Diego de Alcalá in A.D. 1769 marks the point of contact between indigenous populations and Europeans. At the time of contact, the population of Native Americans in what is now San Diego County may have been between 5,000 and 10,000 individuals. Population rapidly declined with the introduction of European diseases, which was further exacerbated by lifestyle changes brought about through Missionization. Native Americans continued to practice many cultural traditions while also successfully adopting new life patterns related to agricultural pursuits and animal husbandry. Today, the Native American people of northern San Diego County are thriving and maintain their connection to spiritual and ritual practices through song, dance, and social gatherings.

Ethnographic records document the presence of two closely affiliated native groups that occupied northern San Diego County and southern Orange County, the Luiseño and Juaneño. Demographics suggest viewing the Proposed Project area as Juaneño/Luiseño borderlands bounded on the northwest by the Gabrieliño and Serrano, to the east by the Cahuilla desert groups, to the southeast by the Cupeño, and to the south by the Kumeyaay (O'Neil and Evans 1980; Johnson and Crawford 1999). All but the Kumeyaay are linguistically similar to the Juaneño/Luiseño, and belong to the Takic subfamily of Uto-Aztecan. The Juaneño/Luiseño occupied a portion of the California coast extending from modern-day San Juan Capistrano southward to Carlsbad. From the Proposed Project area, the nearest ethnohistoric village, known variously as *Hechmai, Quechinga* and *Kecchenga,* is located outside of the Proposed Project area, at the mouth of San Onofre Creek. This is approximately 1 mile south of important ethnohistoric villages *Panhe* and

Souche (also recorded as *Zeucche*) (Kroeber 1925). Other major villages within Luiseño territory include *Katukto*, *Meha*, *Palasakeun*, *Topamai*, *Ushmal*, and *Wiawio*.

For the Juaneño/Luiseño, seasonal food availability and the high degree of resource abundance influenced a flexible settlement pattern. In general, life for the Juaneño/Luiseño was characterized by movement between two to three village centers distributed across the landscape from mountain/highland to coastal/grassland areas. Seasonal resource availability was predicted based on weather patterns, with the most abundant season being fall, when acorn nut harvests began. Winters were usually a time of sparse food when survival based on stored nut and seed resources was key. During this season, a shift to coastal settlements where marine shellfish, fish, and sea mammals could be procured also occurred. A variety of plant resources were available during summer months, including chia, manzanita, and sage. Animal resources were also readily exploited, and included deer, antelope, bear, rabbit, mice, ground squirrels, and a variety of avian species. Predatory species were considered a culinary taboo. Ethnographic evidence suggests a diverse approach to food processing and consumption, where baking, boiling, and roasting allowed for a rich cuisine.

Prior to Missionization, social structure among the Juaneño/Luiseño was organized by autonomous lineages or kin groups that were based on a patrilineal and patrilocal system. This means that new family units lived with the male's side of the family and that descent was passed along the father's line. Ethnohistoric accounts suggest that each lineage held exclusive rights to hunting and gathering territories. Maintenance of spiritual practices was also treated with exclusivity, whereby ceremonial specialists were responsible for the initiation of new ritual group members, performing rituals related to death and cremation, and appointing new religious specialists. Following Missionization, fewer ritual specialists existed and ethnohistoric accounts document the abbreviation of certain ceremonies and a shift away from cremation towards burial.

4.5.1.2 Regional History

Early exploration of the San Diego coast began by ship, occurring first in 1542 as Juan Rodriguez Cabrillo explored the California coast, and again between 1602 and 1603 as Sebastián Vizcaíno sailed a similar course from modern-day San Diego to Monterey Bay. The first land expedition was led by Gaspar de Portolá in 1769 to 1770, setting out from San Diego in June 1769. Portolá set out across the region surrounding the Proposed Project area. The expedition camped near a pool in a valley that Father Juan Crespí named San Juan Capistrano and noted that it would be a good place for a mission. In 1798, Mission San Luis Rey de Francía was placed there along the San Luis Rey River, just inland of what is now Oceanside. On July 20, the expedition travelled approximately 4 to 6 miles and set up camp near a pool of fresh water with a Native American village located nearby in the same coastal plain. Ethnographic records suggest this may have

been the village of *Topomai*. Additional information on the expedition's contacts with local Native Americans is provided in Section 4.6.1.2, *Regional History*.

The period from 1768 to 1821 is often referred to as the Spanish Mission Period. From 1769 to 1823, 21 California missions were established in Alta California. Mission San Diego de Alcalá, the first and southernmost Alta California mission, was established on July 16, 1769. The seventh mission founded in Alta California was Mission San Juan Capistrano, established on November 1, 1776, in Juaneño territory. Local native villages, known by Spanish explorers as rancherias, were incorporated into the mission system.

In 1821, Mexico gained independence from Spain, and in 1848, the United States formally obtained California. The period from 1821 to 1848 is referred to as the Mexican Rancho Period. During this time, there was a change from the subsistence agriculture of the Spanish Mission Period to livestock husbandry on large ranchos. Ranchos were acquired by Mexican citizens through grants or by purchase from mission administrators beginning in 1833, when the Mexican government's Secularization Act changed missions into civil parishes. The Secularization Act initially was intended to give those natives who had inhabited areas adjacent to a Mission half of all mission possessions, including land. However, this did not occur in most instances, and the Secularization Act resulted in the transfer of large mission tracts to politically prominent individuals rather than to local natives.

In August 1835, the property of Mission San Luis Rey was formally transferred to Pío Pico and Pablo de la Portilla, who had been appointed as secular commissioners to oversee the mission operations. Pico retained this position until he was replaced in 1840, but during this time he used his position to dispossess the mission of lands and property with little regard for the lives of Native Americans. The 1840s saw increased tension between the United States and Mexico. Finally, in 1846, war was declared between these two countries. Pico, by then the governor of California, fled to Mexico. By 1847, the United States had established control of California through the Treaty of Guadalupe Hidalgo. In the years immediately following acquisition of California, the cattle industry reached its greatest prosperity. Mexican Rancho Period land grants had created large pastoral estates in California, and a high demand for beef during the Gold Rush led to a cattle boom that lasted from 1849 to 1855. In 1855, however, the demand for California beef began to decline due to the introduction of sheep, causing interest rates to soar and subsequent foreclosure of many ranchos. During the winter of 1861 to1862, a disastrous series of floods occurred in California, followed by 2 years of drought. Many Southern California landowners who survived the collapse of the cattle industry were forced to sell their property due to the drought.

Other Important historical developments that helped shape the growth of San Diego County included developments in stagecoach and railway routes. Stagecoaches began running between San Diego and Los Angeles in the mid-1850s. By 1926, U.S. Highway

101 had been routed and would eventually become Interstate (I-) 5. The introduction of the railway affected portions of northern San Diego County near the Proposed Project area. In the 1880s, as the Atchison Topeka and Santa Fe Railroad (Santa Fe) was building westward across Arizona, Frank Kimball, a San Diego real estate developer, contacted Santa Fe officials to propose making San Diego the western end of the railroad. The Santa Fe agreed, and the California Southern Railroad, a subsidiary of the Santa Fe, built the railroad from San Diego to San Bernardino to meet with the Santa Fe as it crossed over the Cajon Pass. However, a flood in 1883 destroyed portions of the railroad as it passed through northern San Diego County, and in 1886 an alternate coastal "Surf Line" route was constructed, which featured a depot in San Onofre. The San Onofre Depot was built in 1915, closed in 1928, and was removed in 1953. The rail line was sold to the Southern California Regional Railroad Authority in the mid-1990s and today serves commuters and freight delivery, including use of the railroad spur located within the Proposed Project area. The date when the railroad spur was constructed is unknown but is presumed to be post-1968, when Unit 1 of SONGS was first opened.

4.5.1.3 Cultural Resources

Cultural resources reflect the history, diversity, and culture of the region, as well as the people who created them. Cultural resources are unique in that they are often the only remaining evidence of past human activity. Cultural resources can be natural or built, purposeful or accidental, physical or intangible. They encompass archaeological, traditional, and built environmental resources, including buildings, structures, objects, districts, and sites. Cultural resources are considered a nonrenewable resource.

CHRIS SCIC records (McLean 2014) were analyzed for the Proposed Project to identify any previously recorded cultural resources and existing survey reports within the Proposed Project area and surrounding area. Thirteen cultural resources survey reports were completed for the area in and around the Proposed Project (see Table 4.5-1). In addition, the CSLC Shipwrecks Database was consulted on April 10, 2017. One shipwreck is approximately 4 miles offshore of the SONGS site—the "Stranger," a 90-ton oil screw that foundered off the coast of San Onofre in 1948.

Table 4.5-1. Previous Cultural Resources Surveys

CHRIS Report No.	Title	Author	Date
1121262	An Archaeological Survey of the Japanese Mesa and Units 2 and 3 of the San Onofre Nuclear Generating Station	Isham, Dana	1973
1121365	An Assessment of the Archaeological Resources in the Area of the Proposed San Onofre Nuclear Power Plant Protective Earth-Filled Berm	Rosen, Martin D.	1978

Table 4.5-1. Previous Cultural Resources Surveys

1121800	An Archaeological Survey of the Santa Margarita River Valley and Adjacent Areas, Camp Pendleton, San Diego County, California	Welch, Patrick H.A.	1975
1122426	The Cultural Resources of the Pendleton Coast District	Hines, Phillip and Betty Rivers	1975
1130496	Results of the Condition Assessment, Site Monitoring, and Effects Treatment Program Marine Corps Base Camp Pendleton	U.S. Department of the Navy	2006
1131460	A Programmatic Approach for National Register Eligibility Determinations of Prehistoric Sites within the Southern Coast Archaeological Region, California	Reddy, Seetha N.	2007
1131836	An Archaeological Survey of Selected Areas for the Repair of 24 Access Roads to Training Ranges, Marine Corps Base Camp Pendleton, San Diego County, California	Hale, Micah J. and Mark S. Becker	2007
1133500	Cultural Resource Inventory of the San Onofre 1 and Lima 1 Parcels at Marine Corps Base Camp Pendleton, San Diego County, California	Stevens, Nathan	2012
1133834	Section 106 Consultation for Vernal Pool Restoration and Mitigation Area, San Onofre State Park Lease Area, Camp Pendleton	U.S. Marine Corps	2012
1134058	Historic Context Study for Marine Corps Base Camp Pendleton San Diego County, California	Stringer-Bowsher, Sarah, and Dan Killoren	2013
1134059	Results of the Condition Assessment, Site Monitoring, and Effects Treatment Plan (CASMET) Marine Corps Base Camp Pendleton, San Diego County, California	Daniel, James T., Megan Black, Tony Quach, and Mark S. Becker	2011
1134214	2012 Condition Assessment, Site Monitoring, and Effects Treatment (CASMET) Study, MCB Camp Pendleton, San Diego County, California	Berg, John and Brian F. Byrd	2013
In process	Archaeological Survey Report for the Southern California Edison Company for the San Onofre Nuclear Generating Station, Parcels 5, 6 and 7, IO# 330002, San Diego County, California	McLean, Roderic	2014

Source: McLean 2014.

4.5.1.4 Paleontological Resources

Paleontological resources, or fossils, are the evidence of once-living organisms preserved in the geologic record. They include both the fossilized remains of ancient plants and animals and the traces thereof (e.g., track ways, imprints, burrows, etc.). In general, fossils are greater than 5,000 years old (middle Holocene) and are typically preserved in sedimentary rocks. Paleontological resources include not only the actual fossils, but also the collecting localities and the geological deposits that contain the fossils. Paleontological resources are considered nonrenewable resources because the

organisms they represent no longer exist. Thus, once destroyed, these resources can never be replaced.

SONGS is at the northern end of the Peninsular Ranges Geomorphic Province (province), a 900-mile-long northwest-southeast trending structural block that extends from the Transverse Ranges in the north to the tip of Baja California in the south and includes the Los Angeles Basin. The total width of the province is approximately 225 miles, extending from the Colorado Desert in the east, across the continental shelf, to the four southernmost Channel Islands (i.e., Santa Barbara, Santa Catalina, San Clemente, and San Nicolas). It contains extensive pre-Cretaceous (more than 145 million years ago [Ma]) and Cretaceous (145 to 66 Ma) igneous and metamorphic rock covered by limited exposures of post-Cretaceous (less than 66 Ma) sedimentary deposits.

The Proposed Project's surrounding area contains 17 geologic units, ranging in age from the late Holocene to middle Miocene (present to 15.97 Ma). There are four geologic units within the Proposed Project area, including Marine Beach Deposits (Qmb), Old Paralic Deposits (Qop4 and Qop6), San Mateo Formation (Tsm), and Undivided Sedimentary Rocks in Offshore Region (Tmo) (defined below). An analysis of the geologic units within the Proposed Project area (described below) is based on an assessment of the following criteria of paleontological potential of each unit, as defined by the SVP (2010).[40]

- **High Potential:** Rock units from which vertebrate or scientifically significant invertebrate, plant, or trace fossils have been recovered have a High Potential for containing additional scientifically significant paleontological resources.
- **Low Potential:** Rock units poorly represented by fossil specimens in institutional collections, or based on general scientific consensus, are only preserved in rare circumstances; the presence of fossils is the exception, not the rule (e.g., basalt flows or recent colluvium). Rock units with low potential typically do not require impact mitigation measures (MMs) to protect fossils.
- **No Potential:** Some rock units have no potential to contain scientifically significant paleontological resources (e.g., high-grade metamorphic rocks, such as gneisses and schists, and plutonic igneous rocks, such as granites and diorites) and require no protection or MMs relative to paleontological resources.
- **Undetermined Potential:** Rock units for which little information is available concerning their paleontological content, geologic age, and depositional environment have undetermined potential. They require further study (e.g., a field survey) by a qualified professional paleontologist, as defined by the SVP (2010), to determine the paleontological resource potential of these rock units before a paleontological resource impact mitigation program can be developed. Where no

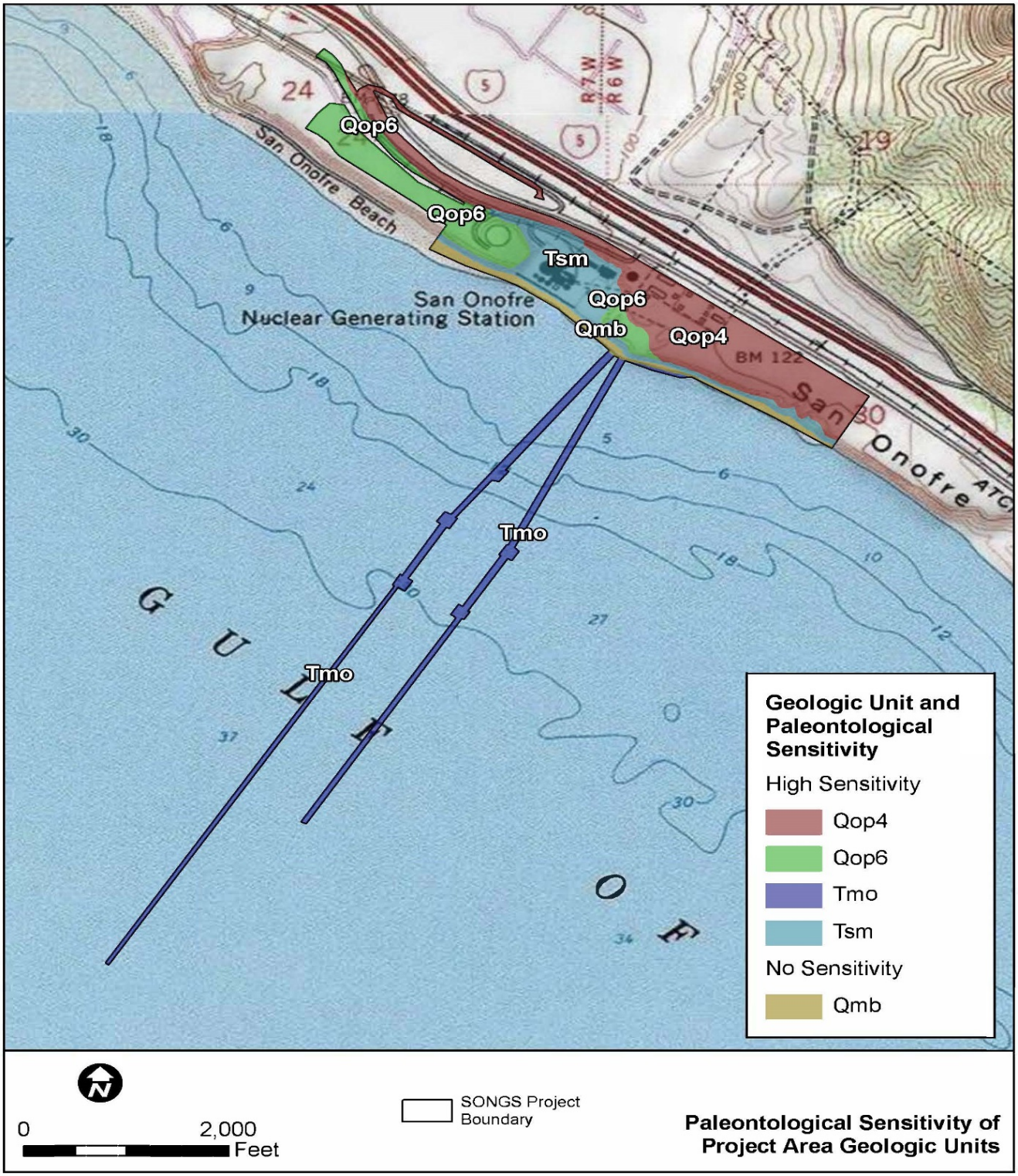
[40] Paleontological potential consists of both (1) the potential for yielding abundant or scientifically significant vertebrate fossils, or for yielding a few scientifically significant fossils, and (2) the importance of recovered evidence for new and scientifically significant data.

subsurface data are available, paleontological potential can sometimes be determined by strategically located excavations into subsurface stratigraphy.

The four major geologic units within the Proposed Project area are described below and shown in Figure 4.5-1. However, some areas around and beneath existing structures may contain artificial fill of an undetermined thickness. Numerical ages for the geologic units within the Proposed Project area, except for artificial fill, are based on information provided by the International Commission on Stratigraphy (2016) and are as follows:

- **Marine Beach Deposits (Qmb).** These deposits date to the Late Holocene (less than 4,200 years ago). While fossils may be encountered in Marine Beach Deposits, due to their formation in deposits that are subject to substantial movement, the fossils are usually not in their original location or stratigraphic context. The relatively younger age of these deposits also results in a lower incidence of plant and animal fossilization. As such, Marine Beach Deposits are considered to have no paleontological sensitivity.
- **Old Paralic Deposits (Qop4 and Qop6).** These deposits date to the Late to Middle Pleistocene (11,700 to 781,000 years ago) and accumulate along the coast in marine, estuarine, and terrestrial environments. As such, these deposits have the potential to preserve both marine and terrestrial animals and plants. Pleistocene marine terrace deposits in northern San Diego County have produced a variety of well-preserved shells of marine and estuarine invertebrates, such as mollusks, crustaceans (e.g., crabs, barnacles), and echinoderms (e.g., sea urchins, sand dollars) (Rieboldt 2014). Terrestrial sediments from river terrace deposits of the same age have yielded specimens of amphibians, reptiles, birds, and mammals (Rieboldt 2014). Based on the quality of preservation and diversity of the fauna, fossils from these deposits are considered scientifically significant, thus giving the Old Paralic Deposits a high sensitivity rating.
- **San Mateo Formation (Tsm).** Dating to the Early Pliocene to Middle Miocene (3.6 to 11.63 Ma), fossils from the San Mateo Formation in the Camp Pendleton-Oceanside area include sharks, rays, bony fishes, sea birds, and marine mammals (e.g., fur seals, walruses, dolphins, porpoises, sperm whales, baleen whales, sea cows) (Rieboldt 2014). Recorded paleontological specimens of this formation include: a rare fossil of a marlin (*Makaira*) and six species of fossil birds, including: murre (*Uria paleohsperis*), guillemot (*Cepphus olsoni*), flightless auk (*Praemancalla* cf. *P. wetmorei*), loon (*Gavia*), albatross (*Diomedea*), and an auklet (*Aethia*) (Rieboldt 2014). Based on the abundance, diversity, and scientific significance of the fossils previously recovered from the geographically and temporally nearby Monterey Formation (Late to Middle Miocene), this unit is considered to have high paleontological sensitivity (Rieboldt 2014).

Figure 4.5-1. Paleontological Sensitivity of Project Area Geologic Units



Sources: Kennedy and Tan 2005; Rieboldt 2014; ESRI 2017.

The Monterey Formation is used to access the sensitivity of the San Mateo Formation due to its similar geologic makeup of sandstone and siltstone, as well as its same temporal range of 5.3 to 15.97 million years ago.

- **Undivided Sedimentary Rocks in Offshore Region (Tmo).** The Undivided Sedimentary Rocks in Offshore Region are Miocene in age (5.2 to 23.03 Ma) and are comparable to other Miocene deposits mapped on land across San Diego and Orange counties. Scientifically important vertebrate, invertebrate, and plant fossils are known from Miocene deposits on land throughout Southern California (Rieboldt 2014). The age of deposits and the fossils that comparable formations have produced result in high paleontological sensitivity.

An evaluation was completed of the surrounding Proposed Project area to identify the presence of recorded paleontological resources, and to determine whether the geologic units of the region contain significant paleontological resources. This evaluation consisted of a literature review and a geographic fossil records search. Information pertaining to paleontological resources was gathered from a review of the paleontological resources report, "Paleontological Resources Assessment, Supplement Parcels 5, 6, and 7: San Onofre Nuclear Generating Station Project, County of San Diego, California" (Rieboldt 2014). The report includes the results of a literature review and geographic fossil records search completed by Rieboldt to identify the presence of recorded paleontological resources and to determine whether the geologic units of the region contain significant paleontological resources. The literature review included a detailed examination of geologic maps of the area as well as published and unpublished literature on the geology and paleontology of northern San Diego County. Published resources used in the review included books, journals, maps, and information available via the internet on government websites. An online search was also performed for paleontological assessments conducted within the Proposed Project boundaries and surrounding areas.

In July 2014, a locality search was also completed by Ms. Nikki Anderson, Lead Fossil Preparator, Department of PaleoServices at the San Diego Natural History Museum. Ms. Anderson studied collection records to determine whether any known fossil localities exist in or near the boundaries of the Proposed Project area. Also, the locality search identified information on the geologic units present in the Proposed Project area. This information was used to determine the paleontological sensitivity rating for geologic units based on the Society of Vertebrate Paleontology's (SVP) guidance, and assess all potential impacts to paleontological resources (SVP 2010).

The results of records searches and pedestrian surveys of nearby Parcels 5, 6, and 7 indicate that the Proposed Project is situated within three geologic strata with high paleontological sensitivity (Rieboldt 2014). While no known paleontological resources are recorded in the immediate area, the recovery of scientifically significant paleontological resources near the Proposed Project area and elsewhere in Southern California from the same or similar geologic deposits (i.e., Old Paralic Deposits [Qop], Very Old Paralic

Deposits [Qvop], the San Mateo Formation [Tsm], the Monterey Formation [TM], and Undivided Sedimentary Rocks in Offshore Region [Tmo]) indicate high paleontological sensitivity with potential to yield paleontological fossil resources if disturbed.

4.5.2 Regulatory Setting

The primary federal and state laws, regulations, and policies that pertain to the Proposed Project are summarized in Appendix A. Applicable San Diego County laws, regulations, and policies are summarized below.

- **Grading, Clearing, and Watercourses Ordinance (Sections 87.101-87.804).** Section 87.216(a)(7) requires changes to grading plans/operations if it is determined that historic or archaeological resources may be located on-site, in which case avoidance or mitigation is required. Section 87.429 requires that grading operations cease if human remains or Native American artifacts are found. Section 87.430 provides for the requirement of a paleontological monitor at the discretion of the County. In addition, the suspension of grading operation is required upon the discovery of fossils greater than 12 inches in any dimension. Section 87.430 also requires notification of the County Official (e.g., Permit Compliance Coordinator) and gives the County Official the authority to determine the appropriate resource recovery operations, which shall be carried out prior to the County Official's authorization to resume normal grading operations.
- **Resource Protection Ordinance (RPO) (Sections 86.601-86.608).** This ordinance requires that cultural resources be evaluated as part of the County's discretionary environmental review process, and if any resources are determined significant under the RPO they must be preserved. The RPO prohibits development, trenching, grading, clearing, and grubbing, or any other activity or use damaging to significant ~~prehistoric~~ precontact or historic site lands, except for scientific investigations with an approved research design prepared by an archaeologist certified by the Register of Professional Archaeologists. Sites determined to be RPO significant must be avoided and preserved.
- **General Plan.** The following paleontological resources goals and policies are identified in the County of San Diego General Plan (August 2011), within which portions of the Conservation and Open Space Element are applicable to the Proposed Project:
    - **GOAL COS-9 Educational and Scientific Uses** determines that paleontological resources and unique geologic features are to be conserved for educational and/or scientific purposes.
    - **Policy COS-9.1 Preservation** requires the salvage and preservation of unique paleontological resources when exposed to the elements during excavation or grading activities or other development processes.

- **Policy COS-9.2 Impacts of Development** requires development to minimize impacts to unique geological features from human related destruction, damage, or loss.

- **Zoning Ordinance.** The Zoning Ordinance provides for the designation and regulation of "special areas," including a Historic/Archaeological Landmark or District. These resources may be assigned an "H" designator for historic areas or a specific district designator (e.g., Julian has a "J" designator). The purpose of these provisions is to identify, preserve, and protect the historic, cultural, archaeological, or architectural resource values of designated landmarks and districts. Zoning regulations for these resources are designed to preserve their integrity and content. Other types of resources of equal or greater significance may exist and be designated in other ways, such as the National Register of Historic Places (NRHP) or California Register of Historical Resources (CRHR).

  County Resource Conservation Areas (RCAs), as defined by this ordinance, are lands requiring special attention to conserve resources in a manner that best satisfies public and private objectives. Implementation actions vary depending upon the conservation objectives of each resource, but may include public acquisition, establishment of open space easements, application of special land use controls such as cluster zoning, large lot zoning, scenic or natural resource preservation overlay zones, or by incorporating special design considerations into subdivision maps or special use permits. RCAs include, but are not limited, to the following: groundwater problem areas, coastal wetlands, native wildlife habitats, construction quality sand areas, intertidal and shoreline sand areas, astronomical dark sky areas, unique geologic formations, and significant archaeological and historical sites. County departments and other public agencies must give careful consideration and special environmental analysis to all projects located in RCAs.

- **Local Register of Historical Resources.** The purpose of the San Diego County Local Register of Historical Resources, established by Local Ordinance Number 9493, is to develop and maintain "an authoritative guide to be used by state agencies, private groups, and citizens to identify the County's historical resources and to indicate which properties are to be protected, to the extent prudent and feasible, from substantial adverse change." Sites, places, or objects that are eligible to the NRHP or the CRHR are automatically included in the San Diego County Local Register of Historical Resources.

- **Historic Site Board.** The County Historic Site Board is an advisory body that provides recommendations to decision makers regarding archaeological and historic cultural resources. The Board is responsible for reviewing resources seeking historic designation and participation in the Mills Act, as well as discretionary projects with significant cultural resources.

4.5.3 Significance Criteria

4.5.3.1 Historical and Archaeological Resources

A project that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment (Pub. Resources Code, § 21084.1). State CEQA Guidelines section 15064.5, subdivision (b) provides significance threshold criteria for determining a substantial adverse change to the significance of a cultural resource:

- Substantial adverse change in the significance of an historical or archaeological resource means physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical or archaeological resource would be materially impaired.

The significance of an historical resource is materially impaired when a project:

- Demolishes or materially alters in an adverse manner those physical characteristics of an historical resource that convey its historical significance and that justify its inclusion in, or eligibility for, inclusion in the CRHR; or
- Demolishes or materially alters in an adverse manner those physical characteristics that account for its inclusion in a local register of historical resources pursuant to Public Resources Code section 5020.1, subdivision (k) or its identification in an historical resources survey meeting the requirements of Public Resources Code section 5024.1, subdivision (g), unless the public agency reviewing the effects of the project establishes by a preponderance of evidence that the resource is not historically or culturally significant; or
- Demolishes or materially alters in an adverse manner those physical characteristics of a historical resource that convey its historical significance and that justify its eligibility for inclusion in the CRHR as determined by a lead agency for purposes of CEQA.

4.5.3.2 Paleontological Resources

An impact to a paleontological resource would be significant if it directly or indirectly destroys a unique paleontological resource or site or unique geologic feature.

4.5.4 Environmental Impact Analysis and Mitigation

Potential direct and indirect construction-related impacts on cultural, historical, and paleontological resources are evaluated below. Although no known cultural resources are in the Proposed Project area that are listed in or eligible for listing in the NRHP, the CRHR, or a local register of historical resources, the Proposed Project would disturb both onshore and offshore areas and, therefore, there is the potential for the inadvertent discovery of previously unidentified cultural resources or inadvertent destruction of human burials

during subsurface soil disturbance that exceeds a depth of 3 feet. Similarly, although no previously recorded paleontological resources are in the Proposed Project area, sediments with high sensitivity for yielding paleontological fossil resources, including geological units or fossil localities containing unique paleontological resources, are present in the area and could be impacted by Proposed Project implementation.

ENVIRONMENTAL IMPACT ANALYSIS

Impacts of the Proposed Project and recommended MMs are examined in this section.

Impact CR-1: Change Significance of Previously Recorded Historical or Unique Archaeological Resources.

There are no known cultural resources located in the Proposed Project area that are listed in or eligible for listing in the NRHP, CRHR, or local register of historical resources **(No Impact).**

Impact Discussion

The results of the cultural resources records search indicate that no known cultural resources are located in the Proposed Project area that are listed in or eligible for listing in the NRHP, the CRHR, or a local register of historical resources; however, 20 cultural resources are recorded within 0.5 mile of the Proposed Project area. Cultural resources within a 0.5 mile of the Proposed Project area include ~~prehistoric~~ precontact resource procurement and seasonal habitation sites, as well as historic sites related to early development of the railroad, bridges, roads, and highway system of northern San Diego County.

In addition, the entire Proposed Project area has been subject to 13 intensive pedestrian surveys between 1973 and 2014 (see Table 4.5-1). None of the surveys resulted in the identification of cultural resources within the Proposed Project area but do reflect a moderate to high density of cultural resources within the coastal area and inland foothill region surrounding the Proposed Project area.

No ~~prehistoric~~ precontact archaeological resources are known to exist within the Proposed Project area or would be adversely impacted by the Proposed Project activities. The buildings and structures, parking lots, and access roads impacted by Proposed Project activities were all constructed at various points in time after 1968. Since these structural elements have an age of less than 50 years, they do not qualify as historical resources and thus do not require further analysis for direct or indirect impacts. The placement of Proposed Project laydown, staging, and storage areas would also not have a direct or indirect adverse effect since none of these areas contain known historical or unique archaeological resources.

Furthermore, the CSLC Shipwrecks Database revealed only one shipwreck located about 4 miles offshore of the SONGS site—the "Stranger," a 90-ton oil screw that foundered off the San Onofre coast in 1948. This historical resource, however, is not within 0.5 mile of the Proposed Project area and is therefore not included in the analysis below.

The Proposed Project would improve a portion of the Santa Fe railroad located in the northwest portion of the Proposed Project area (see Figure 2-4). Improvements would include upgrades along an existing 0.5-mile to 1-mile railroad spur, and would consist of new switching equipment and signals. The Santa Fe railroad was built between 1882 and 1883 and is still in use today (Daniels 2011). A portion of the railroad has been recommended as eligible to the NRHP under Criterion A for its association with historic events that made a significant contribution to the broad patterns of our history (Daly 2015). These contributions are related to the Santa Fe's central role in commercial and urban development throughout California during the late 19th century and early 20th century.

As no work is proposed for the Santa Fe railroad proper, no direct impacts would occur due to Proposed Project activities. Indirect impacts to the NRHP-eligible Santa Fe railroad's 19th century visual or historical setting would not occur since any upgrades to the railroad spur would not cause additional or new changes to the Santa Fe railroad's setting than has already occurred during the spur's initial construction. Therefore, no direct or indirect adverse impacts would occur to the NRHP-eligible Santa Fe railroad.

The Proposed Project upgrades would be limited to the spur line extending from the Santa Fe railroad into the SONGS facility. The spur line is relatively recent and post-dates the construction of SONGS. Although the spur has not been formally evaluated for contributing status to the NRHP-eligible Santa Fe railroad, it is treated in this analysis as a non-contributing element since it is less than 50 years old. Therefore, the Proposed Project would not directly or indirectly impact the railroad spur.

During the Proposed Project, removal of offshore intake and discharge conduits would not result in adverse impacts to cultural or paleontological resources since only vertical structures would be removed, while the portion of the conduit that is below the ocean floor would be left in place. The conduits are modern structures, having an age of less than 50 years, and therefore do not qualify as historical resources. As such, the Proposed Project would not have the potential to directly or indirectly affect any known offshore historical or unique archaeological resources.

Mitigation Measures

No MMs are recommended for Impact CR-1.

Impact CR-2: Change Significance of Previously Unidentified Historical or Unique Archaeological Resources.

Inadvertent disturbance or destruction of a presently unidentified cultural resource could result in a change to the significance of the resource, if it is determined to be eligible for listing in the NRHP or CRHR **(Less than Significant with Mitigation).**

Impact Discussion

A review of previous archaeological surveys and site reports did not identify any reports of historical or archaeological resources in the Proposed Project area or the immediate surrounding area. However, because the Proposed Project area is situated within Holocene sediments, which represent a geological time that human occupation is known to have occurred in, previously unidentified resources could be found during Proposed Project demolition and decontamination activities. In addition, although some prior excavation activities occurred prior to the initial construction of SONGS, the SONGS construction resulted in soil disturbance of at least 70 feet below the original grade across the Onshore Site, the majority of this excavation occurred prior to the enactment of the National Historic Preservation Act of 1966. Therefore, resources may have been inadvertently overlooked or reburied.

All ground disturbing activities that extend more than 3 feet below the ground surface could cause direct or indirect adverse impacts to unidentified cultural resources (see also Section 4.6, *Cultural Resources-Tribal*). The partial or complete disturbance of a resource could alter the setting, context, feeling, integrity, or significance of the resource and affect its eligibility to the NRHP or CRHR. As noted in Table 1-2 in Section 1.0, *Introduction*, upland sands removed as a part of SONGS Units 1, 2, and 3 construction site preparation in the 1960s and 1970s were deposited on tide and submerged lands. These previously undisturbed submerged lands may also contain unidentified cultural resources. Proposed Project work on offshore components would include the partial removal of the vertical structures and a subset of the diffuser ports. Remaining diffuser ports would be abandoned in place, along with the horizontal intake and discharge conduits and fish return system conduit buried beneath the seafloor. Dredging along offshore structural components would occur, and thus the Proposed Project could have the potential to directly or indirectly affect any presently unidentified historical or unique archaeological resources in offshore Proposed Project areas.

In its Applicant-proposed measures (APMs) (see Table 4-2, *Applicant-Proposed Measures*), SCE commits to the following measure to ensure that impacts to cultural resources would be minimized.

APM-10: Cultural Resources Protection. To ensure the Proposed Project does not impact cultural resources, all ground disturbing activities shall be conducted within the ~~existing disturbed area~~historically excavated footprint of the site and shall not encroach on the adjacent surrounding undisturbed areas. The

archeological and/or Tribal monitor shall halt work if archaeological materials (e.g., shell, wood, bone, or stone artifacts) are found or suspected during Proposed Project activities, or the Proposed Project footprint is altered in the area of discovery. ~~The following parties shall be MM notified within 24 hours of the discovery:~~

- ~~Onshore: Marine Corps Base Camp Pendleton (MCBCP) Environmental Science, Cultural Resources Management Branch~~
- ~~Offshore: California State Lands Commission Division of Environmental Planning and Management (CSLC) staff~~

~~Proposed Project work at the discovery site shall not proceed until the MCBCP Archaeologist (onshore) or CSLC staff or its approved monitor (offshore) has evaluated the find and gives permission to resume Proposed Project activities.~~

With implementation of APM-10, the impact related to cultural resources would be reduced, but not to a less-than-significant level.

Mitigation Measures

Implementation of **MMs CR/TCR-2a** through **CR/TCR-2c** would ensure archaeological monitoring for ground disturbing activities exceeding 3 feet in depth and evaluation and treatment of newly discovered resources, pursuant to Public Resources Code section 21084.3. The MMs are designed to address the unique radiological setting of the Proposed Project area, and take into consideration the health and safety of cultural resources specialists involved in the Proposed Project.

MM CR/TCR-2a: Archaeological and Tribal Monitoring. A California State Lands Commission (CSLC) staff-approved archaeological monitor that meets the Secretary of the Interior's Professional Qualifications Standards (as defined in 36 Code of Federal Regulations Part 61), and is certified in hazardous materials response, shall be present for all ground-disturbing activities that may exceed 3 feet in depth in onshore areas. A Tribal monitor that is culturally affiliated with the area may also be present during these activities. The Tribal monitor shall also have certification in hazardous materials response, to be provided by the Applicant or its contractor, if working in or near radiologically contaminated structures, remains of structures, or soils. The archaeological monitor shall complete daily monitoring forms and prepare a summary monitoring report to be submitted weekly to CSLC staff. The archaeological and Tribal monitors have the authority to increase or decrease the monitoring effort should the monitoring results indicate that a change is warranted.

MM CR/TCR-2b: Unanticipated Cultural/Tribal Resources. If potentially significant archaeological or Tribal cultural resources are discovered during demolition activities, work within 100 feet of the find shall be temporarily suspended or redirected away from the discovery. The Applicant or its contractor shall notify California State Land Commission (CSLC) staff and any local, state, or federal agency with approval or permitting authority over the Project that has

requested/required notification within 48 hours of discovery, consistent with guidelines for Tribal involvement stated in the CSLC Tribal Policy (www.slc.ca.gov/About/Tribal.html). The Applicant or its contractor shall retain a CSLC-approved archaeologist and request a culturally affiliated Tribal representative to evaluate the nature and significance of the discovery. In addition, the following shall apply:

- Impacts to previously unknown significant archaeological or Tribal cultural resources shall be avoided through preservation in place if feasible.
- If the lead archaeologist and culturally affiliated Tribal representative believe that damaging effects to archaeological or Tribal cultural resources will be avoided or minimized, then work in the area may resume. Damaging effects shall be avoided or minimized following the measures in Public Resources Code section 21084.3, subdivision (b), unless other measures that would be as or more effective are mutually agreed to by the lead archaeologist and culturally affiliated Tribal representative.
- If resources cannot be avoided, a Treatment Plan developed by the archaeologist and culturally affiliated Tribal representative shall be submitted to CSLC staff for review and approval prior to further disturbance of the area. The plan shall:
    - State requirements for professional qualifications of all cultural resources specialists and Tribal cultural resource workers.
    - Identify appropriate methods of resource recording, artifact cataloguing, and analyses.
    - Determine appropriate levels of recovery or stabilization of resources.
    - Provide documentation of a curatorial facility or museum that will be responsible for the permanent preservation of any unique or sensitive cultural materials resulting from site recovery and stabilization efforts.
- If the discovery is made in radiologically-contaminated Project areas, the archaeologist, Tribal representative, or other Tribal participant(s) shall follow safety protocols not less than those currently established by the U.S. Nuclear Regulatory Commission and Southern California Edison's Requirements for Site Access and Access to Protected/Restricted Radiologically Controlled Areas, which include: (1) authorized searches; (2) processing and training requirements; (3) radiation protection; and (4) maintenance of a safety-conscious work environment.

MM CR/TCR-2c: Cultural Resource Identification during Offshore Geophysical Surveys. The Applicant or its contractor shall ensure that a qualified maritime archaeologist that meets Secretary of the Interior Professional Qualifications Standards defined in 36 Code of Federal Regulations Part 61, approved by California State Lands Commission (CSLC) staff, participates in the development and implementation of the geophysical surveys conducted to develop the Anchoring and Dredging Plans. The archaeologist shall identify any cultural resources found during the surveys and prepare a summary report to be submitted to CSLC staff. Title to all abandoned shipwrecks, archaeological sites,

and historic or cultural resources on or in the tide and submerged lands of California is vested in the State and under the jurisdiction of the CSLC. The final disposition of archaeological, historical, and paleontological resources recovered on State lands under the jurisdiction of the CSLC must be approved by the Commission.

With implementation of APM-10, and **MMs CR/TCR-2a**, **CR/TCR-2b**, and **CR/TCR-2c**, the risk to undiscovered resources would be reduced to a less-than-significant level.

Impact CR-3: Disturb Unidentified Human Remains.

Ground disturbing activities could adversely impact presently unidentified human remains, including those interred outside of dedicated cemeteries **(Less than Significant).**

Impact Discussion

A review of previous archaeological surveys and site reports did not identify any reports of human remains in or surrounding the Proposed Project area. However, previously unidentified human remains could be found as the area is situated within Holocene sediments, which represent a geological time during which human occupation occurred. If human remains or related resources are discovered, such resources shall be treated in accordance with state and local regulations and guidelines that govern the disclosure, recovery, relocation, and preservation of human remains (State CEQA Guidelines § 15064.5, subd. (e)). SCE commits to the following APM to ensure that impacts to human remains would be further minimized.

APM-11: Appropriate Treatment of Human Remains. In accordance with state law (Health & Saf. Code, § 7050.5; Pub. Resources Code, § 5097.98), if human remains are found, all ground disturbing activities shall halt within 165 feet (50 meters) of the discovery. The County Coroner shall be notified within 24 hours of the discovery. No further excavation or disturbance of the discovery or any nearby area reasonably suspected to overlie potential remains shall occur until the County Coroner has determined whether the remains are subject to his or her authority. The County Coroner must make this determination within 2 working days of notification of the discovery (pursuant to Health & Saf. Code, § 7050.5, subd. (b)). If the County Coroner determines that the remains do not require an assessment of cause of death and that the remains are, or are believed to be Native American, the Coroner must notify the Native American Heritage Commission (NAHC) by telephone within 24 hours, which must in turn immediately notify those persons it believes to be the Most Likely Descendant (MLD) of the deceased Native American. The MLD shall complete its inspection and make recommendations within 48 hours of being granted access to the site. The MLD may recommend means for treatment or disposition, with appropriate dignity, of the human remains and any associated grave goods. CSLC staff shall

discuss and confer with the MLD regarding their recommendations (pursuant to Pub. Resources Code, § 5097.98, subds. (b) and (c)).

Implementation of APM-11 would ensure that adverse effects resulting from the inadvertent discovery of human remains would be less than significant.

Mitigation Measures

No MMs are recommended for Impact CR-3.

Impact CR-4: Destruction of Unique Paleontological Resources.

Sediments with high sensitivity for yielding paleontological fossil resources would be impacted, potentially resulting in direct or indirect impacts to sensitive paleontological resources **(Less than Significant with Mitigation).**

Impact Discussion

Based on previous evaluations, there are no recorded sensitive paleontological fossil resources within the Proposed Project area; however, there are three highly sensitive geological units located within the Proposed Project area. There is potential across the entire onshore Proposed Project area (as shown in Figure 2-1) that sediments containing high sensitivity paleontological resources would be encountered during Proposed Project grading, excavation, and demolition activities. High sensitivity sediments include Old Paralic Deposits (Qop4 and Qop6) and San Mateo Formation (Tsm) (see Figure 4.5-1). The Undivided Sedimentary Rocks in Offshore Region (Tmo) (see Figure 4.5-1) also has high potential to yield scientifically important fossils, based on the age and type of fossil species recovered from comparable deposits on land (Rieboldt 2014). However, the partial removal of the vertical structures and selected diffuser ports during offshore work would not result in direct or indirect adverse impacts to paleontological resources because offshore Proposed Project activities would not disturb buried structural components.

Direct impacts to paleontological resources include the disturbance or destruction of scientifically significant geologic units containing fossil localities. Indirect impacts to these resources include the permanent and irreversible loss of scientific information from paleontological fossils and their host units. Pursuant to federal, state, and local (County of San Diego) laws, sensitive and rare fossil finds should be studied for the benefit of society. Thus, onshore activities under the Proposed Project have potential to cause direct and indirect impacts to high sensitivity geologic units with potential to yield significant fossil localities.

Mitigation Measures

Implementation of **MMs CR-4a** and **CR-4b** would ensure that adverse effects resulting from the inadvertent discovery of unique paleontological or geologic resources during

Proposed Project dismantlement and decontamination would be less than significant. This is achieved by creating a monitoring plan that ensures a qualified paleontologist who meets professional paleontologist qualifications (based on SVP guidance) would be able to identify paleontological resources discovered during Proposed Project activities, and prepare monitoring forms, summaries, and management plans as described in "A Foundation for Best Practices in Mitigation Paleontology" (Murphey et al. 2014). These MMs also facilitate the scientific evaluation and reporting of any paleontological resources unearthed during decommissioning activities and ensures the permanent curation of these resources. MM CR-4b ensures that any inadvertent discoveries of fossil specimens, fossil localities, or geologic units are made available for educational and scientific uses through the curation of any discovered paleontological resources, which may then be made available for additional study or be placed on museum display to the general public, pursuant to County of San Diego General Plan goals. Further, **MM CR-4a** takes into consideration that potentially hazardous sediments may contain paleontological finds.

MM CR-4a: Paleontological Monitoring. A qualified paleontologist must be present to monitor all ground disturbing activities within the onshore area. The paleontological monitor shall:

- Have certification in Hazardous Materials Response procedures if working in or near radiologically contaminated structures, remains of structures, or soils.
- Follow safety protocols established by the Southern California Edison's Requirements for Site Access and Access to Protected/Restricted-Radiologically Controlled Areas, which includes: (1) authorized searches; (2) processing and training requirements; (3) radiation protection; and (4) maintenance of a safety-conscious work environment.
- Fill out daily monitoring forms and prepare a weekly summary monitoring report.
- Have the authority to increase or decrease the monitoring effort should the monitoring results indicate that a change is warranted.

MM CR-4b: Unanticipated Paleontological Resources. In the event unanticipated paleontological resources or unique geologic resources are encountered during demolition activities, work within 100 feet of the find shall be temporarily suspended or redirected away from the discovery until the Applicant retains a qualified paleontologist, who has demonstrated experience in carrying paleontological projects to completion, to evaluate the nature and significance of the discovery. If the resource cannot be avoided, the paleontologist shall develop and implement a Paleontological Resources Management Plan for the Proposed Project area that includes specimen identification to the lowest taxonomic level possible, analysis, curation, and the preparation of a final report. The plan shall be submitted to California State Lands Commission staff for review and approval prior to further disturbance of the area.

Implementation of **MMs CR-4a** and **CR-4b** would ensure that adverse effects resulting from destruction of unique paleontological resources would be less than significant.

4.5.5 Cumulative Impacts

With regard to cultural and paleontological resources, cumulative impacts may occur if any project were to affect the historical, archaeological, and paleontological resource base within the Proposed Project area. If the effects of the Proposed Project, taken together with the effects of other projects, collectively degrade the resource base, then those impacts are considered cumulatively considerable. As discussed in Section 3.2, *Relevant Cumulative Projects*, and shown in Table 3-2, 24 reasonably foreseeable cumulative projects fall within the geographic area near SONGS considered for potential cumulative impacts related to cultural and paleontological resources.

Of the projects listed in Table 3-2, 25 are within the MCBCP (see Cumulative Projects ID Nos. 1 through 25); three of these projects (ID Nos. 1, 2, and 5) involve the existing SONGS facility. Most of these MCBCP projects are completed, under construction, or have been approved for implementation, thus their respective decision-makers found them to be both consistent with federal, state, and local policies and regulations pertaining to historical resources, unique archaeological, burials, and sensitive paleontological resources. Future projects proposed within the coastal area of northern San Diego County would also likely comply with existing federal, state, and local laws and regulations relevant to cultural and paleontological resources.

Direct cumulative impacts to cultural resources include the cumulative and permanent loss of known and as-yet-undiscovered significant resources. Other projects in the northern San Diego County coastal region have resulted, or may result in, destruction of cultural resources and thus cumulatively affect the regional resource base. Nearby projects completed in the past have also resulted in the identification of fossil localities yielding significant paleontological resources (Rieboldt 2014). Sediments with high sensitivity may preserve rare and scientifically significant remains of species not yet known to science, or more complete specimens of known species, and the possibility for scientific study would be lost when such a locality or potential for a significant fossil find is destroyed or buried.

Proposed D&D activities would occur in areas that were previously disturbed during construction and operation of SONGS. There are no known historical or unique archaeological resources within the Proposed Project area. In addition, fossil localities in the area are rare and unevenly distributed through geological formations throughout this region. Although Proposed Project activities in combination with other projects along the coast of northern San Diego County could contribute to the progressive loss of sensitive paleontological resources, with implementation of APM-10, and **MMs CR/TCR-2a**, **CR/TCR-2b**, **CR/TCR-2c**, **CR-4a**, and **CR-4b**, the Proposed Project would either avoid nearly all impacts to fossil resources or would result in the recovery of important scientific information. Mitigation for any foreseeable projects would require professional qualification for paleontologists, and monitoring plans that ensure rigorous study of fossil

finds. Therefore, the Proposed Project would have a less-than-significant cumulative impact to historical or unique archaeological or paleontological resources.

4.5.6 Future Activities

Although no known historical or unique archaeological resources or recorded sensitive paleontological fossil resources are in the Proposed Project area, ground-disturbing activities that extend more than 3 feet below the ground surface could directly or indirectly affect unidentified archaeological and paleontological resources. Should Future Activities involve soil disturbance 3 feet below the ground surface, presently unidentified archaeological and paleontological resources could be directly or indirectly affected. If the California Coastal Commission determines that the Approved ISFSI must be relocated as part of the application renewal process, new environmental analyses of the proposed ISFSI location would be undertaken.

Offshore activities would include removal of the solid covers on the Unit 2 discharge conduit. This would require only the removal of accumulated sand in areas previously disturbed during removal of vertical structures, and therefore, would not impact archaeological or paleontological resources. If required by the Commission, removal of the remaining discharge conduit diffuser ports could directly or indirectly affect presently unidentified historical or unique archaeological resources offshore, which may require new environmental analyses and appropriate protection measures for known and potentially undiscovered archaeological and paleontological resources.

Removal of the seawall, public beach access walkway, and riprap below -2 Mean Lower Low Water, and final dismantlement of the Approved ISFSI are also Future Activities. At present, the seawall, public access walkway, and riprap are less than 50 years of age, and thus do not qualify as historical resources. The public access walkway has in the past and is presently undergoing upgrades that alter its original construction design and materials used. Thus, by the time Future Activities are addressed, the walkway would not likely qualify as a historical resource eligible for the NRHP or CRHR. The Proposed Project area also has sediments containing high sensitivity paleontological resources, which may be encountered during additional grading and excavation as part of Future Activities. Thus, long-term onshore activities have the potential to cause direct and indirect impacts to high sensitivity geologic units with potential to yield significant fossil localities.

APM-10, APM-11, and **MMs CR/TCR-2a**, **CR/TCR-2b**, **CR/TCR-2c**, **CR-4a**, and **CR-4b** could be implemented to reduce the significance of future impacts to archaeological and paleontological resources; however, at this time, Future Activities are considered speculative and potential impacts will be evaluated at a later date.

4.5.7 Summary of Proposed Mitigation Measures

Table 4.5-2 provides a summary of the mitigation and Applicant-proposed measures.

Table 4.5-2. Cultural Resources Impact/Mitigation Summary

Impact	MM/APM
CR-1: Change Significance of Previously Recorded Historical or Unique Archaeological Resources	None recommended
CR-2: Change Significance of Previously Unidentified Historical or Unique Archaeological Resources	APM-10: Cultural Resources Protection MM CR/TCR-2a: Archaeological and Tribal Monitoring MM CR/TCR-2b: Unanticipated Cultural/Tribal Resources MM CR/TCR-2c: Cultural Resource Identification during Offshore Geophysical Surveys
CR-3: Disturb Unidentified Human Remains	APM-11: Appropriate Treatment of Human Remains
CR-4: Destruction of Unique Paleontological Resources	MM CR-4a: Paleontological Monitoring MM CR-4b: Unanticipated Paleontological Resources

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4.6 CULTURAL RESOURCES - TRIBAL

Assembly Bill (AB) 52 (Gatto; Stats. 2014, ch. 532), which was enacted in September 2014, sets forth both procedural and substantive requirements for analysis of Tribal cultural resources, as defined in Public Resources Code section 21074, and consultation with California Native American Tribes. This section discusses Tribal cultural resources or other resources potentially of importance to California Native American Tribes in the San Onofre Nuclear Generating Station (SONGS) Project area, identifies applicable significance thresholds, assesses the Proposed Project's impacts to these resources and their significance, and recommends measures to avoid or substantially reduce any effects found to be potentially significant.

The environmental setting is based on information obtained from the Proposed Project description, recent technical studies, and information gathered during outreach conducted by the California State Lands Commission (CSLC) consistent with its adopted Tribal Consultation Policy (see www.slc.ca.gov/About/Tribal.html; CSLC 2016a).

4.6.1 Environmental Setting

The area of potential effect (APE) is approximately 120 acres (99 acres onshore and 21 acres offshore) and includes the onshore SONGS site, two buried intake and discharge conduits that extend from the power plant into the Pacific Ocean along with a collocated fish return conduit, and the area of disturbance from disposition activities. The APE is located within diverse ecological settings that include terrestrial and marine ecosystems.

The onshore region consists of coastal mesas, lowlands, and foothills that are separated by numerous alluvial drainages. Major drainages include San Onofre Creek and San Mateo Creek to the northwest of the Proposed Project area, with Las Pulgas Creek and Aliso Canyon to the southeast (Stringer-Bowsher and Killoren 2013). These drainages provided freshwater and a variety of terrestrial food resources, both plant and animal. The abundance and availability of these critical food and water resources is evident in archaeological studies that reveal nearly 10,000 years of Native American occupation in the region and historic populations that depended on the coastal/foothill landscape during early development of the San Diego historic livestock industry. The Proposed Project is located on a coastal terrace at the lower reaches of Horno Canyon. Flora is dominated by a coastal sage scrub plant community, while chaparral is found along bluffs. The area was significantly altered to construct SONGS, with only the bluffs at the western boundary remaining undisturbed by human activity. However, the bluffs have been significantly altered due to ongoing natural processes (e.g., bluff erosion) marked by precipitation runoff and sea inundation (Isham 1973). Historic photos and site assessments document the prior excavation activities that occurred during the initial construction of SONGS, which resulted in soil disturbance of at least 70 feet below the original grade across the Onshore Site.

The offshore Proposed Project area begins at the shoreline where two intake/discharge conduits extend a maximum of 1.6 miles past the littoral zone into the open ocean. Climate change has shaped and altered the ~~prehistoric~~ precontact and modern human experience in coastal regions (Moratto 1984). Important changes include fluctuations in sea surface temperature over millennia and the effects of El Niño-Southern Oscillation (ENSO) on sediment deposition and wave energy that has caused erosion to shorelines. In addition, the geological setting of the Proposed Project area is marked by dynamic tectonic processes that have continued to shape the ocean basins and adjacent land masses. In the broader San Diego County region, archaeological evidence of ENSO patterns measured by sediment flux over time has revealed that lagoon closure and the development of sandy beaches occurred approximately 5,000 years ago (Masters and Aiello 2007). During the Late Period (approximately 1,300 to 800 years before present [BP]) environmental changes affected the availability of rocky kelp environments that provided fish and other marine mammal food sources, and sandy beaches that provided abundant shellfish food resources varied. The presence/absence of these resource environments over time had significant implications for the lived experiences of ~~prehistoric~~ the indigenous hunters, gatherers, and fishers that once occupied the region.

In addition, studies of mean sea level over time indicate that the ~~prehistoric~~ precontact shoreline of the Proposed Project area was likely a 0.5 mile to 1 mile farther out than is observed today (Isham 1973; Masters and Aiello 2007). The inundation of the Pacific coastline due to rising sea levels has resulted in the submergence of key archaeological sites that yield evidence of the earliest human occupations of coastal North America (Moratto 1984). Indeed, there are over 30 recorded coastal sites in California dating to between 9,500 to 8,000 radiocarbon years BP, and 10 submerged ~~prehistoric~~ precontact sites identified within the San Diego County region (ICF International, et al. 2013; Erlandson 2004).

4.6.1.1 ~~Prehistory~~ Precontact History of San Diego County

The ~~prehistoric~~ occupation of San Diego County by Native American communities extends to at least 10,000 BP and has a complex culture history. There are over a dozen ~~prehistoric~~ precontact cultural chronologies that have been published since the 1970s. Of these, culture sequences by Rogers (1945) and Wallace (1955) are most frequently used in northern San Diego County and within the area surrounding the Proposed Project. The following terms are used to describe changes to cultural patterns within the northern San Diego County coastal region: Paleoindian, Archaic, and Late Precontact (previously referred to as Prehistoric). A discussion of the Paleoindian period (11,500 BP to 8,500/7,500 BP), the Archaic period (8,500 BP to 1,300/800 BP), Late ~~Prehistoric~~ Precontact (1,300/800 BP to 200 BP), and the ethnohistory of the area is presented in Section 4.5, *Cultural and Paleontological Resources*.

4.6.1.2 Regional History

As discussed in Section 4.5.1.2, *Cultural and Paleontological Resources – Regional History*, early exploration of the San Diego coast began by ship during voyages by Juan Rodriguez Cabrillo in 1542 and Sebastián Vizcaíno between 1602 and 1603. In June 1769, Gaspar de Portolá set out by land across the region surrounding the Proposed Project area, noting two indigenous villages at each end of the coastal valley. The expedition camped near a pool and soon was visited by over 40 Native Americans. Father Juan Crespí named the valley San Juan Capistrano and noted that it would be a good place for a mission. In 1798, Mission San Luis Rey de Francía was placed there, in Luiseño territory, along the San Luis Rey River just inland of what is now Oceanside. On July 20, the expedition travelled approximately 4 to 6 miles and set up camp near a pool of fresh water. More than 60 Native Americans came to visit that evening and indicated that their main village was located nearby in the same coastal plain. Ethnographic records suggest this may have been the village of *Topomai.* In the days that followed, as the expedition travelled north along the coast, explorers observed Native Americans systematically burning the landscape, as well as having well-made baskets and homes made of willow.

The period from 1768 to 1821 is often referred to as the Spanish Mission Period. From 1769 to 1823, 21 California missions were established in Alta California. Mission San Diego de Alcalá, the first and southernmost of the Alta California missions, was established on July 16, 1769. The seventh mission founded in Alta California was Mission San Juan Capistrano, established on November 1, 1776, in Juaneño territory. Local native villages, known by Spanish explorers as rancherias, were incorporated into the mission system. Ultimately, Spanish colonization resulted in the destruction of native culture and society.

In 1821, Mexico gained independence from Spain, and in 1848, the United States formally obtained California. The period from 1821 to 1848 is referred to as the Mexican Rancho Period. During this time, the subsistence agriculture of the Spanish Mission Period changed to livestock husbandry on large *ranchos.* Ranchos were acquired by Mexican citizens through grants or by purchase from mission administrators beginning in 1833, when the Mexican government's Secularization Act changed missions into civil parishes. The Secularization Act initially was intended to give those natives who had inhabited areas adjacent to a Mission half of all mission possessions, including land. However, this did not occur in most instances, and the Secularization Act resulted in the transfer of large mission tracts to politically prominent individuals rather than to local natives.

In August 1835, the property of Mission San Luis Rey was formally transferred to Pío Pico and Pablo de la Portilla, who had been appointed as secular commissioners to oversee the mission operations. Pico retained this position until he was replaced in 1840, but during this time he used his position to dispossess the mission of lands and property with

little regard for the lives of Native Americans. The 1840s saw increased tension between the United States and Mexico. Finally, in 1846, war was declared between these two countries. Pico, by then the governor of California, fled to Mexico. By 1847, the United States had established control of California through the Treaty of Guadalupe Hidalgo.

4.6.1.3 Luiseño and Cupeño Tribes

The Pala Band of Mission Indians and Rincon Band of Mission Indians are two of the six federally recognized tribes of Luiseño bands based in Southern California, all with reservations. The Juaneño Band of Mission Indians Acjachemen Nation is currently seeking federal recognition.

The Luiseño, or Payómkawichum, are a Native American people who at the time of the first contact with the Spanish in the 16th century inhabited the coastal area of Southern California, ranging 50 miles from the present-day southern part of Los Angeles County to the northern part of San Diego County, and inland 30 miles. In the Luiseño language, the people call themselves Payómkawichum (also spelled Payómkowishum), meaning "People of the West." The tribe was named Luiseño by the Spanish due to their proximity to the Mission San Luís Rey de Francia mentioned previously. Estimates for the pre-contact populations of most native groups in California have varied substantially. In the 1920s, A. L. Kroeber put the 1770 population of the Luiseño (including the Juaneño) at 4,000 to 5,000; he estimated the population in 1910 as 500. The historian Raymond C. White proposed a historic population of 10,000 in his work of the 1960s. The Luiseño language belongs to the Cupan group of Takic languages, within the major Uto-Aztecan family of languages. About 30 to 40 people speak the language (Luiseño 2017).

Several different groups combined to form Cupeño culture around 1,000 to 1,200 AD. They were closely related to Cahuilla culture. The Cupeño people traditionally lived in the mountains in the San Jose Valley at the headwaters of the San Luis Rey River. They lived in two autonomous villages, Wilákalpa and Kúpa, also spelled Cupa, located north of present-day Warner Springs, California. They also lived at Agua Caliente, located east of Lake Henshaw in an area crossed by State Highway 79 near Warner Springs. By the late 1800s, the hot sulfur springs found on the Cupa territories were becoming very popular and attracting visitors from Los Angeles and San Diego. The popularity of the destination and the growing California population began the events which ultimately led to the expulsion of the Cupans from their homeland. Today, more than 90 years after having been expelled from their native homeland, the Cupeños call Pala home and live as one among the Luiseño tribe. Alfred L. Kroeber estimated the 1770 population of the Cupeño as 500. Lowell John Bean and Charles R. Smith put the total in 1795 ~~put the total~~ between 500 and 750. By 1910, the Cupeño population had dropped to 150, according to Kroeber. Later estimates have suggested that there were fewer than 150 Cupeño in 1973, but 200 in 2000. The Cupeño language belongs to the Cupan group, which includes the Cahuilla

and Luiseño languages. This grouping is of the Takic branch within the Uto-Aztecan family of languages (Cupeño 2017).

The Pala Band of Mission Indians reservation on 12,273 acres in northern San Diego County is home to most of the 918 enrolled members, both Cupeño and Luiseño Indians. The Pala Band of Mission Indians is governed by a six-member Executive Committee. Committee members are elected by the General Council, which includes all qualified voters 18 years and older. Elections are held every 2 years in November. The Tribe is governed by a constitution adopted in November 1994 and certified by the BIA Pacific Region in 1997 retroactive to 1994. The primary economic ventures for the tribe include the Pala Casino Resort & Spa and a 90-acre avocado grove (Pala 2017).

The Rincon Band of Luiseño Indians, established ~~is~~in 1875, occupies a 6,000-acre reservation in Valley Center, and has a tribal population of 500 plus enrolled members. The elected Rincon Tribal Council consists of five members: Chairperson, Vice Chairperson, and three council members. Tribal Council members are elected by the membership, serving 2-year-staggered terms. In addition to serving as the executive, legislative, and judicial branches of the government, the Tribal Council is the board of directors for tribal enterprises, including Harrah's Rincon, one of the premier resorts and casinos in Southern California. Other economic ventures include the Rincon Travel Plaza, which opened in 2012. This facility contains a gas station, convenience store, sandwich shop, and car wash, and serves hotel and casino employees and guests, local residents, along with travelers driving through the reservation. The tribe, through First Nations Capital Partners, LLC (FNCP), currently owns the controlling interest in a plastic card manufacturing company located in Southern California and a cordage and rope manufacturing company located in Washington State. In addition, FNCP has provided a working capital loan to a manufacturer of fitness equipment headquartered in Southern California with manufacturing facilities in the State of Virginia (Rincon 2017).

The Juaneño Band of Mission Indians Acjachemen Nation occupied a large region in ~~prehistory~~ precontact history that included Los Angeles, Orange County, and San Diego counties. The Acjachemen Nation has over 1,941 enrolled members with headquarters in San Juan Capistrano (Capistrano Dispatch 2013). The Acjachemen Nation is not currently federally recognized but is considered a California Native American tribe, as defined in Public Resources Code section 21073. An application for federal recognition was submitted in 1982 and denied in 2011. In 2013, the Bureau of Indian Affairs approved a request for reconsideration, which was referred to the Secretary of the Interior for further review (Juaneño 2016). The Tribal Council consists of four members that are elected by enrolled members. In 2016, the Acjachemen Nation received approval from the City of San Juan Capistrano to build a 1.3-acre park and education center at one of the tribe's most sacred sites, the village of *Putuidem* (Indian Country Today 2016).

4.6.1.4 Tribal Coordination

Following Governor Brown's issuance of Executive Order B-10-11 concerning coordination with Tribal governments in public decision making, the CSLC adopted a Tribal Consultation Policy (Policy) in August 2016 to provide guidance and consistency in its interactions with California Native American tribes (CSLC 2016a). The Policy, which was developed in collaboration with Tribes, other state agencies and departments, and the Governor's Tribal Advisor, recognizes that Tribes have a connection to areas that may be affected by CSLC actions and "that these Tribes and their members have unique and valuable knowledge and practices for conserving and using these resources sustainably" (CSLC 2016a).

The Native American Heritage Commission (NAHC) maintains two databases to assist cultural resources specialists in identifying cultural resources of concern to California Native Americans. On June 17, 2016, the CSLC contacted the NAHC to obtain information about known cultural and Tribal cultural resources and request a list of Native American tribal representatives who may have geographic or cultural affiliation in the Proposed Project area. The NAHC responded on July 7, 2017, stating that the Sacred Lands File database did not include any previously identified sacred sites in the Proposed Project area. The NAHC also forwarded a list of 24 Native American groups or individuals, which the CSLC used for outreach and coordination. In addition, two Tribes with geographic or cultural affiliation in San Diego County submitted written requests to the CSLC for notification of CEQA projects pursuant to AB 52 (see generally, Pub. Resources Code, § 21080.3.1).

In July 2016, the CSLC sent project notification letters and an invitation to consult under AB 52 to the Chairs of the two tribes who had previously requested notification – the San Luis Rey Band of Luiseño Mission Indians and the Torres Martinez Desert Cahuilla Indians. The CSLC also notified the twenty-four individuals identified on the NAHC contact list to ensure those tribes would have an opportunity to provide meaningful input on the potential for Tribal cultural resources to be found in the Proposed Project area, and recommend steps to be taken to ensure adverse impacts to Tribal cultural resources are avoided. The outreach letters sent in July 2016 included the following:

- Barona Group of Capitan Grande Band of Mission Indians
- Campo Band of Mission Indians
- Ewiilaapaayp Tribal Office
- Iipay Nation of Santa Ysabel
- Inaja Band of Mission Indians
- Jamul Indian Village
- Juaneño Band of Mission Indians
- Juaneño Band of Mission Indians Acjachemen Nation-Belardes
- Juaneño Band of Mission Indians Acjachemen Nation-Romero
- Kwaaymii Laguna Band of Mission Indians
- La Jolla Band of Luiseño Indians
- La Posta Band of Mission Indians
- Manzanita Band of Kumeyaay Nation
- Mesa Grande Band of Mission Indians
- Pala Band of Mission Indians

- Pauma Band of Luiseno Indians
- Pechanga Band of Mission Indians
- Rincon Band of Mission Indians
- San Pasqual Band of Mission Indians
- Soboba Band of Luiseño Indians
- Sycuan Band of Kumeyaay Nation
- Viejas Band of Kumeyaay Indians

In addition, the CSLC received the following letters in response to outreach notifications. There were no responses to AB 52 notifications.

- The Pala Band of Mission Indians Tribal Historic Preservation Office (Pala THPO) stated that the Proposed Project area is within the Tribe's Traditional Use Area. The Pala THPO requested to be updated of any changes to the Proposed Project boundary and to receive information related to previously and newly recorded sites, but did not request formal government-to-government tribal consultation. The Pala THPO recommended the presence of an archaeological monitor onsite during decommissioning activities.
- The Rincon Band of Luiseño Indians (Rincon Tribe) expressed their concern for inadvertent discoveries of cultural resources and stated that known burials have been identified in the surrounding area. The Rincon Tribe recommended the presence of a Native American Monitor for all ground disturbing activities and requested additional government-to-government tribal consultation; however, consultation did not commence due to certain project details being revised in 2017. After the Applicant's submittal of a revised Proposed Project description, CSLC staff sent additional Proposed Project details to the Rincon Tribe in May 2018 to ensure the Tribe had opportunity to engage in meaningful input and consultation. Efforts to solicit the Rincon Tribe's comments and suggestions were ongoing at the time of publication of the Draft EIR.
- CSLC staff also received a notification request letter from the La Posta Band of Mission Indians, a federally-recognized Tribe in San Diego County, on November 4, 2017. Although the La Posta Tribe does not appear to be traditionally or culturally affiliated with the Proposed Project area, staff sent an outreach letter in January 2018.

No additional written comments were received.

4.6.1.5 Tribal Cultural Resources

As described in Section 4.5, *Cultural and Paleontological Resources*, 20 archaeological sites have been recorded within 0.5 mile of the Proposed Project area, but none are within the Project boundaries. Some of these sites may meet the definition of a Tribal cultural resource. No other potential Tribal cultural resources have been identified, to date, for the Proposed Project area, although continuing tribal coordination could provide additional information on sites, features, places, cultural landscapes, sacred places, or objects with cultural value to a Tribe in the Proposed Project area.

4.6.2 Regulatory Setting

The primary federal and state laws, regulations, and policies that pertain to the Proposed Project are summarized in Appendix A. While no local regulations or policies that explicitly address Tribal cultural resources exist, Section 4.5.2, *Cultural and Paleontological Resources – Regulatory Setting*, summarizes regulatory ordinances and other county policies that concern cultural resources, which may also be relevant to Tribal cultural resources if Tribal cultural resources are determined to also be unique archaeological or historical resources. These resources include sites, features, places, cultural landscapes, and sacred places or objects that have cultural value or significance to a tribe. A Tribal cultural resource is one that is either: (1) listed on, or eligible for listing on the CRHR or local register of historical resources (see Section 4.5, *Cultural and Paleontological Resources,* for more information about the CRHR); or (2) a resource that the lead agency, at its discretion and supported by substantial evidence, determines is significant pursuant to the criteria in Public Resources Code section 5024.1, subdivision (c) (see Pub. Resources Code, § 21074). Further, because tribes traditionally and culturally affiliated with a geographic area may have specific expertise concerning their Tribal cultural resources, AB 52 sets forth requirements for notification and invitation to government-to-government consultation between the CEQA lead agency and geographically affiliated tribes (Pub. Resources Code, § 21080.3.1, subd (a)). Under AB 52, lead agencies must avoid damaging effects to Tribal cultural resources, when feasible, regardless of whether consultation occurred or is required.

4.6.3 Significance Criteria

Public Resources Code section 21084.2 states, “A project with an effect that may cause a substantial adverse change in the significance of a Tribal cultural resource is a project that may have a significant effect on the environment.” Lead agencies are directed to avoid damaging effects to Tribal cultural resources, when feasible. If measures are not otherwise identified in consultation with affected tribes to mitigate a substantial adverse change to a Tribal cultural resource, the examples of measures provided in Public Resources Code section 21084.3 may be considered, if feasible.

An impact to Tribal cultural resources would be significant if the project would cause a substantial adverse change in the significance of a Tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American Tribe, and that is:

- Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1, subdivision (k), or
- A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in Public

Resources Code section 5024.1, subdivision (c). In applying the criteria set forth in Public Resources Code section 5024.1, subdivision (c), the lead agency shall consider the significance of the resource to a California Native American tribe.

4.6.4 Environmental Impact Analysis and Mitigation

Although there are no known Tribal cultural resources located in the Proposed Project area that are listed in or eligible for listing in the National Register of Historic Places (NRHP), the CRHR, or a local register of historical resources, the Proposed Project has the potential to disturb both onshore and offshore areas. Previously unidentified Tribal cultural resources may be inadvertently discovered during decommissioning activities.

Relevant material also considered in this impact analysis includes information from the cultural resources report, "Archaeological Survey Report for the Southern California Edison Company for the San Onofre Nuclear Generating Station, Parcels 5, 6, and 7, IO# 330002, San Diego County, California" (McLean 2014, provided in Appendix G of this EIR). This document also includes the results of a literature and records search at the California Historical Resources Information System (CHRIS) South Coastal Information Center (SCIC) and information taken from California Prehistory: Colonization, Culture, and Complexity (Jones and Klar 2007).

ENVIRONMENTAL IMPACT ANALYSIS

Impacts of the proposed Project and recommended mitigation measures (MMs) are examined in this section.

Impact TCR-1: Change Significance of Previously Recorded Tribal Cultural Resources.

There are no known Tribal cultural resources located in the Proposed Project area that are listed in or eligible for listing in the NRHP, CRHR, or local register of historical resources **(No Impact).**

Impact Discussion

No Tribal cultural resources (e.g., areas of spiritual significance, plant collection areas) are known to exist within the onshore or offshore Proposed Project areas. Therefore, no Tribal cultural resources would be adversely impacted, either directly or indirectly, by Proposed Project activities, including placement of laydown, staging, and storage areas.

Mitigation Measures

No MMs are recommended for Impact TCR-1.

Impact TCR-2: Change Significance of Previously Unidentified Tribal Cultural Resources.

Inadvertent disturbance or destruction of a presently unidentified Tribal cultural resource could result in a change to the significance of the resource if it is determined to be eligible for listing in the NRHP or CRHR **(Less than Significant with Mitigation).**

Impact Discussion

A review of previous surveys, ethnographic reports, and site reports did not identify any reports of Tribal cultural resources in the Proposed Project area or within 0.5 mile of SONGS. However, in response to tribal outreach, the Rincon Tribe reported that at least one sensitive Tribal cultural resource is known to exist nearby, outside the Proposed Project area. The nearby presence of an ethno historic village, known variously as *Hechmai*, *Quechinga*, and *Kecchenga*, suggests the possibility of traditional cultural resources in the Proposed Project area. In addition, the area is situated within Holocene sediments, which represent a geological time that human occupation is known to have occurred. In general, the coast of California was densely populated by Native Americans in ~~prehistoric~~ precontact and historic periods (Jones and Klar 2007). Although prior excavation activities occurred prior to the initial construction of SONGS, which resulted in soil disturbance of at least 70 feet below the original grade across the Onshore Site, the majority of this excavation occurred prior to the enactment of the National Historic Preservation Act of 1966. Therefore, resources may have been inadvertently overlooked or reburied. Therefore, there is a moderate ~~to high~~ potential that previously unidentified Tribal cultural resources, including human burials, could be found during decommissioning activities.

As noted in Table 1-2 in Section 1.0, *Introduction*, upland sands removed as a part of SONGS Units 1, 2, and 3 construction site preparation in the 1960s and 1970s were deposited on tide and submerged lands. These previously undisturbed submerged lands may also contain unidentified Tribal cultural resources. Proposed Project work in offshore components would include the partial removal of the vertical structures and a subset of the diffuser ports. The remaining diffuser ports would be abandoned in place, along with horizontal intake and discharge conduits and fish return conduit buried beneath the seafloor. Dredging along offshore structural components would occur, and thus the Proposed Project could have the potential to directly or indirectly affect any presently unidentified Tribal cultural resources in offshore Proposed Project areas. Onshore Proposed Project activities involve soil disturbance 3 feet below the ground surface, which would also have the potential to directly or indirectly affect presently unidentified Tribal cultural resources. The partial or complete disturbance or destruction of a resource would directly alter the significance of the resource and affect its eligibility to the NRHP or CRHR. Indirect changes that alter the setting, context, feeling, or integrity of the resource would occur if the resource was disturbed or destroyed.

SCE commits to the following Applicant-proposed measures (APMs) to ensure that impacts to Tribal cultural resources would be minimized.

APM-10: Cultural Resources Protection (see Section 4.5, *Cultural and Paleontological Resources*).

APM-11: Appropriate Treatment of Human Remains (see Section 4.5, *Cultural and Paleontological Resources*).

Implementation of these APMs would not reduce the impact related to Tribal cultural resources to a less-than-significant level.

Mitigation Measures

In addition to implementation of APM-10 and APM-11, implementation of the following MMs would reduce the risk to previously unidentified Tribal cultural resources to a less-than-significant level would also ensure tribal monitoring for ground disturbing activities exceeding 3 feet in depth (pursuant to Pub. Resources Code, § 21084.3).

MM CR/TCR-2a: Archaeological and Tribal Monitoring (see Section 4.5, *Cultural and Paleontological Resources*).

MM CR/TCR-2b: Unanticipated Cultural/Tribal Resources (see Section 4.5, *Cultural and Paleontological Resources*).

MM CR/TCR-2c: Cultural Resource Identification during Offshore Geophysical Surveys (see Section 4.5, *Cultural and Paleontological Resources*).

The MMs:

- establish requirements for the development of an appropriate treatment plan to evaluate newly discovered resources, including human burials
- ensure that tribal groups that are traditionally and culturally affiliated with the Proposed Project area can engage in discussions to identify an appropriate means of resource recovery, restoration, or off-site mitigation if needed in the case of discovery of radiologically contaminated cultural materials
- are designed to address the unique radiological setting of the Proposed Project area and take into consideration the health and safety of cultural resources specialists and Tribal monitors.

Impact TCR-3: Disturb Unidentified Tribal Human Remains.

Ground disturbing activities could adversely impact presently unidentified Tribal human remains, including those interred outside of dedicated cemeteries **(Less than Significant).**

Impact Discussion

A review of previous archaeological surveys and site reports did not identify any reports of human remains in the Proposed Project area or the immediate surrounding area. However, because the Proposed Project area is situated within Holocene sediments, which represent a geological time that human occupation is known to have occurred in, previously unidentified human remains could be found. If human remains or related resources are discovered, such resources shall be treated in accordance with state and local regulations and guidelines that govern the disclosure, recovery, relocation, and preservation of human remains (State CEQA Guidelines § 15064.5, subd. (e)).

SCE commits to the following APM to ensure that impacts to human remains would be minimized.

- **APM-11: Appropriate Treatment of Human Remains** (see Section 4.5, *Cultural and Paleontological Resources*).

Implementation of APM-11 would ensure that adverse effects resulting from the inadvertent discovery of human remains would be reduced to less than significant.

Mitigation Measures

No MMs are recommended for Impact TCR-3.

4.6.5 Cumulative Impacts

With regard to Tribal cultural resources, cumulative impacts may occur if any project were to affect the Tribal cultural resource base within the Proposed Project area. If the effects of the Proposed Project, taken together with the effects of other projects, result in a collective degradation of the resource base, then those impacts are considered cumulatively considerable. As discussed in Section 3.2, *Relevant Cumulative Projects*, and shown in Table 3-2, 22 reasonably foreseeable cumulative projects fall within the geographic area near SONGS considered for potential cumulative impacts related to Tribal cultural resources.

Of the projects listed in Table 3-2, three projects (ID Nos. 1, 2, and 5) involve the existing SONGS facility. Most of these MCBCP projects are completed, under construction, or approved for implementation, thus their respective decision-makers found them to be both consistent with federal, state, and local policies and regulations pertaining to important

~~Tribal cultural resources~~ Tribal cultural resources, which may also be historical resources, unique archaeological sites, or human burials. Future projects proposed within the coastal area of northern San Diego County would also likely comply with existing federal, state, and local laws and regulations relevant to Tribal cultural resources.

Direct cumulative impacts to Tribal cultural resources include the cumulative and permanent loss of known and as-yet-undiscovered significant resources. Other projects in the northern San Diego County coastal region have resulted, or may result, in the destruction of Tribal cultural resources, and thus have a cumulatively considerable impact on the regional resource base. However, there are no known Tribal cultural resources within the Proposed Project area. Therefore, the Proposed Project would have no cumulatively considerable impact to Tribal cultural resources.

4.6.6 Future Activities

As stated above, no Tribal cultural resources are known to exist within the Proposed Project area. However, all ground-disturbing activities that extend more than 3 feet below the ground surface have the potential to cause adverse impacts, both direct and indirect, to unidentified Tribal cultural resources that may exist in those locations. Should Future Activities of the SONGS Decommissioning Plan involve soil disturbance 3 feet below the ground surface, presently unidentified Tribal cultural resources could be directly or indirectly affected. Future Activities include additional removal of structural elements (i.e., the seawall, public beach access walkway, and riprap) below -2 Mean Lower Low Water, and final dismantlement of the Approved ISFSI, which would also require new environmental analyses and appropriate protection measures for known and potentially undiscovered Tribal cultural resources.

Offshore activities would include removal of the solid covers from the mammal exclusion barriers on the Unit 2 discharge conduit, and if required by the Commission, removal of the remaining discharge conduit diffuser ports. Removal of the solid covers from the Unit 2 discharge conduit would require removal of accumulated sand in areas previously disturbed during removal of vertical structures, and therefore, would not impact Tribal cultural resources. However, removal of the remaining diffuser ports would require dredging along offshore structural components, and could have the potential to directly or indirectly affect any presently unidentified Tribal cultural resources in offshore areas.

Implementation of APM-10 and APM-11, and **MMs CR/TCR-2a** and **CR/TCR-2b** could reduce the significance of future impacts to Tribal cultural resources; however, at this time, Future Activities are considered speculative and potential impacts will be evaluated at a future date.

4.6.7 Summary of Proposed Mitigation Measures

Table 4.6-1 provides a summary of the mitigation and Applicant-proposed measures.

Table 4.6-1. Tribal Cultural Resources Impact/Mitigation Summary

Impact	MM/APM
TCR-1: Change Significance of Previously Recorded Tribal Cultural Resources	None recommended
TCR-2: Change Significance of Previously Unidentified Tribal Cultural Resources	APM-10: Cultural Resources Protection APM-11: Appropriate Treatment of Human Remains MM CR/TCR-2a: Archaeological and Tribal Monitoring MM CR/TCR-2b: Unanticipated Cultural/Tribal Resources MM CR/TCR-2c: Cultural Resource Identification during Offshore Geophysical Surveys
TCR-3: Disturb Unidentified Tribal Human Remains	APM-11: Appropriate Treatment of Human Remains

4.7 GEOLOGY, SOILS, AND COASTAL PROCESSES

This section describes existing geologic and soil conditions and coastal processes in the Proposed Project area, including seismic hazards and coastal erosion, identifies applicable significance thresholds, assesses the Proposed Project's impacts to geology and soils and their significance, and recommends measures to avoid or substantially reduce any effects found to be potentially significant. The environmental setting is based on the Applicant's project description, recent technical studies, the San Onofre Nuclear Generating Station (SONGS) Decommissioning Project (Units 2 and 3 Offshore Conduits) Engineering Study of Conduit Disposition Alternatives (COWI Marine North America [COWI] 2017), and applicable local, state, and federal agencies.

While this section provides background information on regional seismicity and coastal processes, this Environmental Impact Report (EIR) evaluates potential significant impacts of the Proposed Project on the environment, not vice versa (i.e., not the impacts of an earthquake, tsunami, or other existing geologic-related hazard on the Proposed Project or on spent nuclear fuel [SNF] stored at SONGS), in accordance with the California Supreme Court's decision in December 2015 in *California Building Industry Association v. Bay Area Air Quality Management District* (2015) 62 Cal. 4th 369, 386 (CBIA v. BAAQMD). In CBIA v. BAAQMD, the Court held:

> *In light of CEQA's text, statutory structure, and purpose, we conclude that agencies subject to CEQA generally are not required to analyze the impact of existing environmental conditions on a project's future users or residents. But when a proposed project risks exacerbating those environmental hazards or conditions that already exist, an agency must analyze the potential impact of such hazards on future residents or users. In those specific instances, it is the project's impact on the environment—and not the environment's impact on the project—that compels an evaluation of how future residents or users could be affected by exacerbated conditions.*

Proposed Project activities that may affect coastal processes include decommissioning of the offshore intake, outfall, and fish return conduits, vertical risers, and buoys.

4.7.1 Environmental Setting (Geology and Soils)

The study area for the Proposed Project is generally defined as the onshore portions of the Proposed Project site and the ~~onshore~~ offshore and shoreline areas immediately adjacent. For seismic-related analyses, a larger study area of 62 miles (100 kilometers [km]) of the Proposed Project was identified to capture significant active and potentially active faults in southern Orange County and San Diego County, consistent with recent geotechnical and seismic studies pertaining to the SONGS site and facilities. The current condition and quality of geologic and soil resources was used as the baseline against which to compare potential impacts of the Proposed Project.

4.7.1.1 Geology

The onshore portion of the Proposed Project lies along the western, coastal edge of the Peninsular Ranges Province (Norris and Webb 1990), an approximately 900-mile-long, northwest-southeast oriented complex of mountain ranges ranging in width from 30 to 100 miles. The province consists primarily of a diverse assortment of metasedimentary rocks (sedimentary rocks altered by heat or pressure) that were intruded by Cretaceous bodies of igneous rock of the Peninsular Ranges Batholith. Subsequent erosion created extensive late Pleistocene and Holocene alluvial fans blanketing much of the metamorphic and granitic bedrock and filling intervening valleys. The western edge of the province is characterized by a series of marine terraces, resulting from coastal uplift and sea level changes, which extends several miles inland to elevations of at least 800 feet.

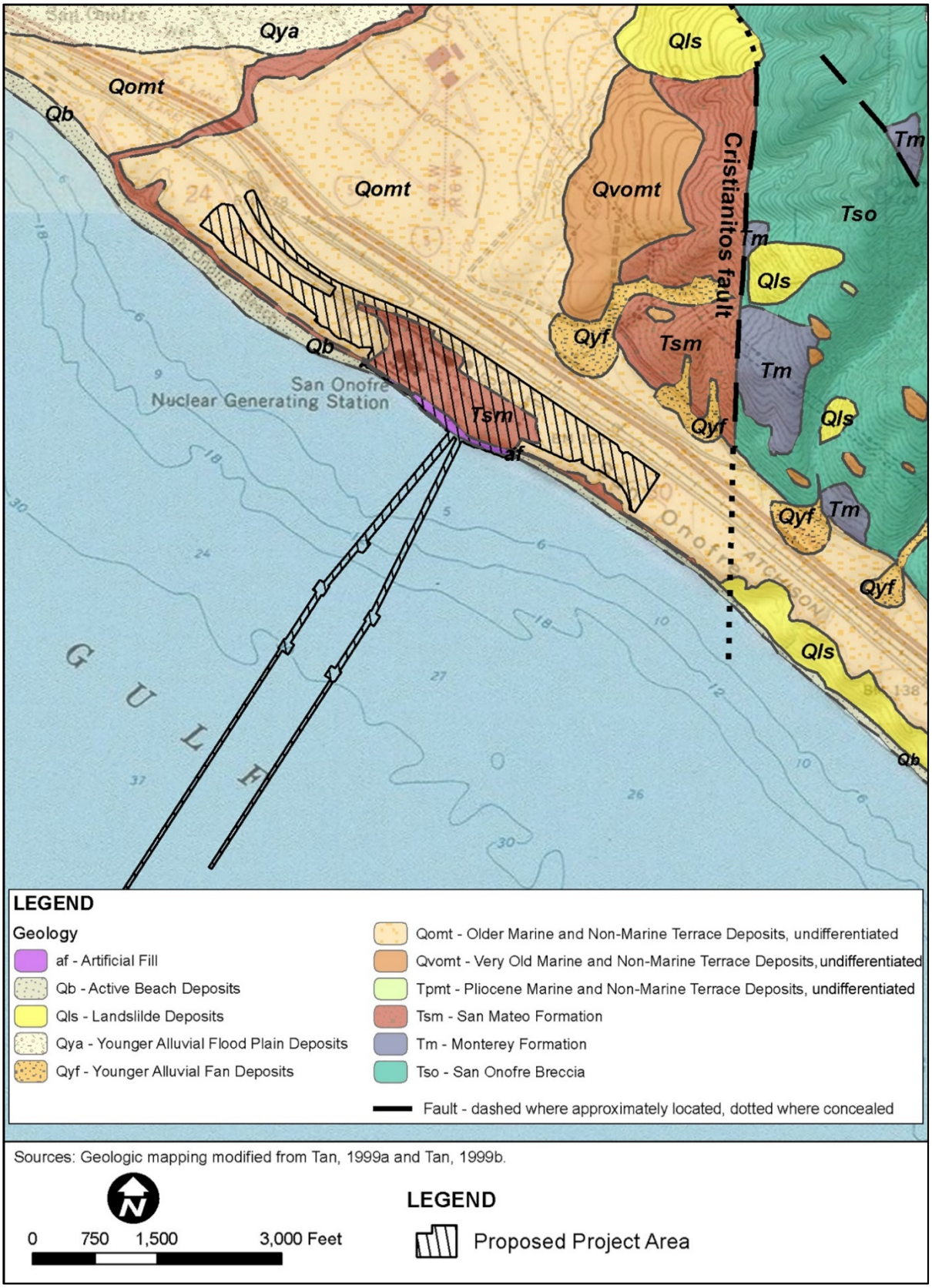
The offshore area lies on the eastern edge of the Inner California Continental Borderlands (ICB), a highly deformed portion of the offshore continental margin (i.e., the continental shelf, slope, and rise) from Dana Point to Carlsbad Canyon (Klotsko et al. 2015). The ICB consists of a series of fault-bounded generally northwest-trending basins and ridges, with some ridges, such as the Channel Islands, extending above sea level. Bedrock in the IBC consists of folded and faulted Cretaceous and older igneous and metamorphic rocks overlain by Tertiary sedimentary rocks and relatively thick deposits of Quaternary unconsolidated sediments of mud (silt and clay) and sand (U.S. Geological Survey [USGS] 1974).

The physiography of the Proposed Project area is dominated by its location on a relatively narrow, gently seaward sloping coastal terrace. Near SONGS, the coastal plain narrows as it approaches the San Joaquin Hills in Orange County to an approximate width of 1,500 to 1,800 feet. A steep sea cliff, the San Onofre Bluffs, has developed along the marine terrace north and south of SONGS and ranges in height from about 60 to 125 feet. Based on elevation, the site is divided into upper and lower topographic areas. The upper area, at about 90 to 120 feet above Mean Lower Low Water (MLLW), encompasses the Supplemental Support Area (SSA), North Owner Controlled Area (NOCA), Switchyard Area (SYA), Make Up Demineralizer Area (MUDA), and South Yard Facilities Area (SYFA). The lower area, consisting of the Units 2 and 3 operational areas, includes the North Protected Area Yard (NPAY), Unit 2 Area (U2A), Turbine Building Area (TBA), Auxiliary Building Area (ABA), Intake Structure Area (ISA), Unit 3 Area (U3A), and South Protected Area Yard (SPAY) on a cut pad at approximately 30 feet MLLW (GeoPentech 2013), and the North Industrial Area (NIA) on a pad at about 20 feet MLLW (GEI 2015).

Geologic Units

Geologic units at the Proposed Project site consist of artificial fill over Quaternary older marine terrace deposits and Tertiary San Mateo Formation. General descriptions of the geologic materials, listed chronologically, are summarized below (see Figure 4.7-1).

Figure 4.7-1. Geologic Units in the Proposed Project Area



- Artificial Fill – Geotechnical borings have encountered artificial fill at thicknesses ranging from 1 to 17.5 feet; artificial fill as thick as 30 feet may be present adjacent to deep structures and the seawall that was emplaced as construction backfill adjacent to the structures (GEI 2015; GeoPentech 2013). Thin artificial fill of several inches to a few feet can be expected to be found beneath all roads and other impervious surfaces in the upper SONGS area. The artificial fill typically consists of dense to very dense sand and gravel (GEI 2015). Much of the sandy artificial fill was derived locally from excavated San Mateo Formation sandstone.
- Quaternary Older Marine and Non-Marine Terrace Deposits (Qomt) – Based on geotechnical borings completed on-site during previous studies, the older marine and non-marine terrace deposits at SONGS are composed of clayey sands to silty clays in the upper part of the terrace and gravel, cobbles, and local boulders up to 2 feet in diameter in the lower part of the terrace (GEI 2015; GeoPentech 2013). During construction of the SONGS facilities, terrace deposits underlying the SSA, NOCA, SYA, MUDA, and SYFA were graded to elevations ranging from about 90 to120 feet MLLW. In the NIA and Units 2 and 3 Power Block areas, terrace deposits were completely removed during grading and excavation for the construction of Units 2 and 3, exposing the underlying San Mateo Formation (GeoPentech 2013).
- Tertiary San Mateo Formation (Tsm) – This formation is a generally dense to very dense, coarse-grained sandstone with minor finer grained zones in which local fine sandstone, siltstone, and claystone interbeds and scattered lenses of pebble-cobble conglomerate have been noted (GEI 2015). At the Proposed Project site, the formation is laterally continuous and at least 900-feet thick (Southern California Edison [SCE] 2016a). Clayey and silty clasts within the Formation are visible in some site construction photos just below the terrace deposits (SCE 2016f).

Faults and Earthquakes (Seismicity)[41]

The seismicity of Southern California is dominated by the intersection of the north-northwest trending San Andreas Fault system and east-west trending Transverse Ranges fault system. Both systems respond to strain produced by the relative motions of the Pacific and North American Tectonic Plates. The closest fault to SONGS is the ~~inactive~~ Cristianitos fault, which is a north-northwest trending fault located approximately 0.25 miles south of the SONGS site. The fault is approximately 20 miles long and extends from near the base of the Santa Ana Mountains to about 0.6 miles offshore, where it dies out in a series of folds offshore (SCE 2016f). The Cristianitos fault has been extensively studied with results indicating no earthquakes or surface ruptures on the fault in the past 125,000 years, and likely not the last 500,000 years (the 125,000-year old overlying terrace deposits were shown not to have been offset by the fault) (SCE 2016f). Consequently, the Cristianitos fault is not considered an active fault by the CGS nor a capable fault by the NRC, and was not considered ~~or~~ a seismic source in licensing earthquake ground motion assessments for Units 2 and 3 (GeoPentech 2013; SCE 2016f). The nearest active fault to the SONGS site is an offshore segment of the Newport-Inglewood Fault Zone, passing about 4.3 miles to the west of SONGS. Tables 4.7-1 and 4.7-2 and Figure 4.7-2 summarize and show fault zones near the Proposed Project area.

[41] The California Geological Survey (CGS) classifies faults as active (surface displacement in the last 11,700 years), pre-Holocene (fault determined not to have had Holocene rupture), and age-undetermined (age of last surface rupture has not been determined) (CGS 2018). The NRC uses the terminology of *capable fault*, which are faults that have had one of more of the following: surface rupture in the last 50,000 years; move, reoccurring movement in the last 500,000 years; or macro-seismicity directly correlated to the fault (NRC 2018). ~~Faults can be classified based on California Geological Survey (CGS) criteria (CGS 1999; CGS 2003):~~

- ~~Historically Active – Faults that have generated earthquakes accompanied by surface rupture during historic time (~ last 200 years) and faults that exhibit aseismic fault creep.~~
- ~~Active – Faults that show geologic evidence of movement within Holocene time (~ last 11,000 years).~~
- ~~Potentially Active – Faults that show geologic evidence of movement during the Quaternary time (~ last 1.6 million years).~~
- ~~Inactive – Faults that show direct geologic evidence of inactivity during all of Quaternary time or longer.~~

An earthquake is classified by the amount of energy released, which was traditionally quantified using the Richter Magnitude scale, but is now often quantified using the Moment Magnitude (M) scale as the M scale provides a more accurate measurement of the size of major and great earthquakes. The Richter Magnitude and M scales are nearly identical for earthquakes of less than M7.0. M scale readings are slightly greater than a corresponding Richter Magnitude for earthquake magnitudes greater than M7.0.

Table 4.7-1. Regional Fault Zones Near Proposed Project Site

Fault Zone	Description
Newport-Inglewood – Rose Canyon	The closest active fault zone, the Newport-Inglewood – Rose Canyon Fault Zone, lies approximately 4.3 miles to the west offshore (see Figure 4.7-2). Recent Scripps Institution of Oceanography studies (Sahakian et al. 2017) using seismic reflection for the offshore sections reveal that the offshore fault zone consists of four main fault strands separated by three main step-overs along strike. One step-over offshore of San Onofre is less than 0.6 mile in width. Modeling based on study data indicates that earthquakes of M6.6 to M7.4 magnitude could occur on the offshore segments, with the higher magnitudes representing rupture of several or all the fault strands (Sahakian et al. 2017).
Palos Verdes – Coronado Bank	The Coronado Bank fault of the Palos Verdes – Coronado Bank Fault Zone lies approximately 14 miles offshore. (Recent analysis of geophysical surveys suggests that the two faults may not be connected [Maloney et al. 2016]). Slip-rates for the Coronado Bank Fault Zone have not been directly measured due to the difficulty of physically measuring slip rates for offshore faults (Maloney et al. 2016). In comparison, slip rates for the Palos Verdes Fault are 0.08 to 0.12 inch/year. No earthquakes greater than M4.0 have been recorded along the Coronado Bank Fault Zone; however, a review of regional earthquakes for the period of 1900 to 2017 indicates numerous small earthquakes up to a maximum of M5.0 were recorded along the Palos Verdes Fault (USGS 2017b).
Elsinore	In historical times, the Elsinore fault, which lies onshore to the east of the Proposed Project site has been one of the quietest in Southern California, with the main trace of the Elsinore fault zone having only experienced one event greater than M5.2, an earthquake of about M6.0 in 1910 near Temescal Valley that produced no known surface rupture and did little damage.
San Jacinto	The San Jacinto Fault Zone, a major element of the San Andreas fault system, is the most seismically active fault in Southern California This fault zone is a complex system of strike-slip fault segments connected by releasing and restraining bends and stopovers The San Jacinto Fault Zone has produced at least eight earthquakes greater than M6.0 since 1890, including the M6.8 (1918) San Jacinto earthquake to the east of the Proposed Project area; and the M6.5 (1968) Borrego Mountain and the M6.6 (1987) Superstition Hills and Elmore Ranch earthquakes southeast of the Proposed Project area near the Salton Sea.

Note: M = Moment Magnitude scale.

Table 4.7-2. Significant Active and Potentially Active Faults within 50 Miles

Name	Distance from Proposed Project[1] (miles)	Estimated Maximum Earthquake Magnitude[2,3] (M)	30-Year Probability of Mw ≥ 6.7 Earthquake[4] (%)
Newport-Inglewood – Offshore section alone or rupture spanning Newport-Inglewood-Rose Canyon	4.3	7.0-7.5	1.2
Coronado Bank alone or rupture spanning Palos Verdes-Coronado Bank	14.3	7.4-7.7	3.0
San Joaquin Hills Blind Thrust	17.1	7.1	0.6
Rose Canyon alone	18.6	6.9	1.5
Palos Verde alone	26.4	7.3	3.3
Newport Inglewood – Onshore section alone	28.3	7.2	1.2
Elsinore – Temecula section alone or in various rupture combinations with Julian, Whittier, Glen Ivy, and Coyote Mountain sections	22.2	7.1-7.8	5.0
Elsinore – Glen Ivy section alone or in combination with the Whittier section	23.8	6.9-7.3	
Elsinore – Julian section alone or in combination with the Coyote Mountain section	31.6	7.4-7.5	
Elsinore – Whittier section alone	31.8	7.0	1.9
San Jacinto – Anza section alone or in various rupture combinations with Coyote Creek, Borrego Mountain, Superstition Mountain, San Jacinto Valley, San Bernardino Valley, and Clark sections	44.5	7.3-7.8	9.2
San Jacinto – San Jacinto Valley section alone or in combination with the San Bernardino Valley section	45.5	7.0-7.4	
San Jacinto – San Bernardino Valley section alone	48.3	7.0	5.3
Puente Hills Blind Thrust – Santa Fe Springs section	41.4	6.7	1.0
Puente Hills Blind Thrust – Los Angeles section	47.8	7.0	

Sources and Notes:

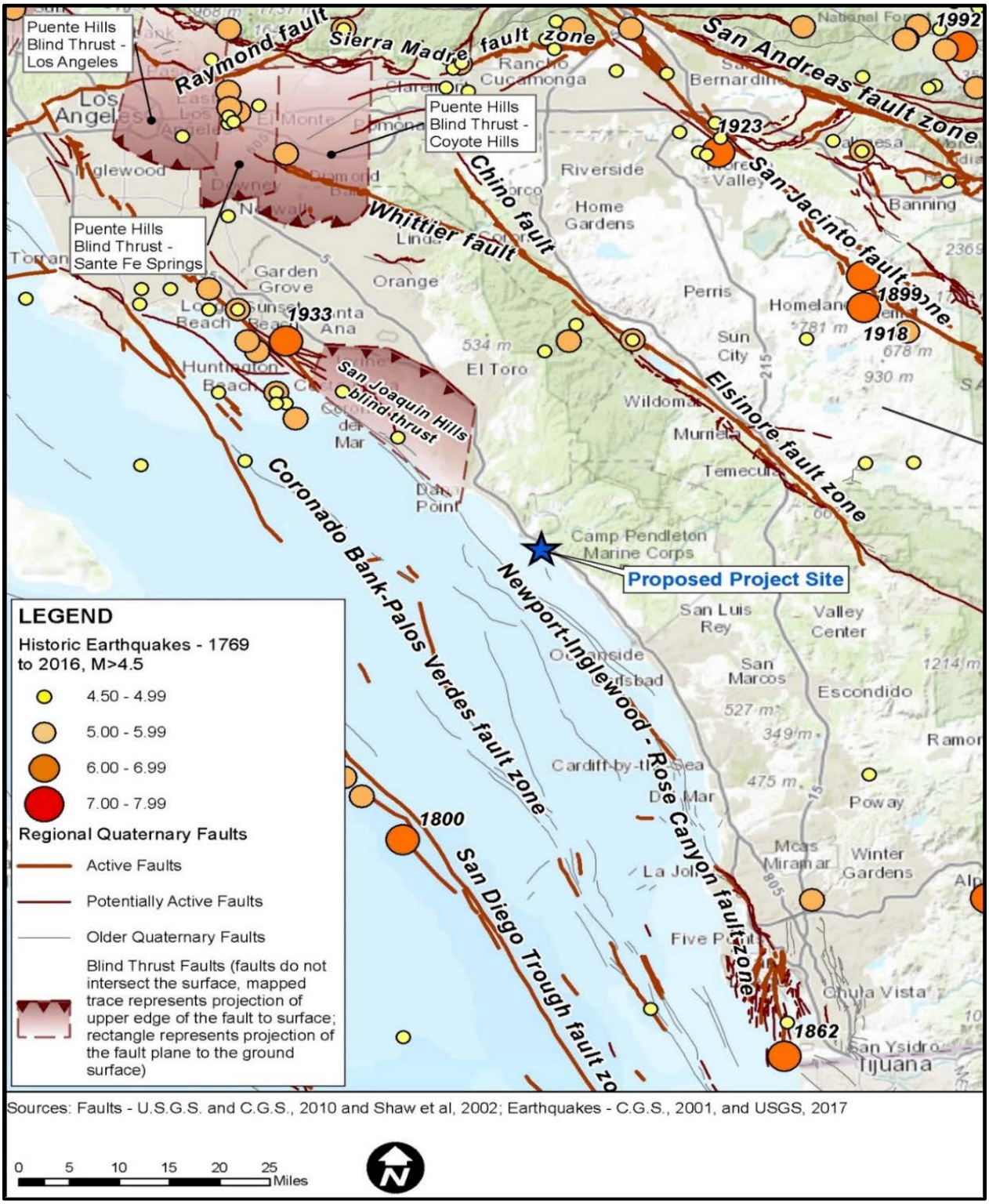
[1] Fault distances obtained from USGS Earthquake Hazards Program, 2008 National Seismic Hazard Maps – Source Parameters website (USGS 2017b) and USGS and CGS Quaternary Fault and Fold Database of the United States (USGS & CGS 2010).

[2] Maximum Earthquake Magnitude – the maximum earthquake that appears capable of occurring under the presently known tectonic framework, magnitude listed is "Ellsworth-B" magnitude from 2008 National Seismic Hazard Maps – Source Parameters website (USGS 2017b)

[3] Range of magnitudes represents varying rupture scenarios of one or more segments along a fault.

[4] 30-year probability of Mw ≥ 6.7 earthquake based on USGS (2015) 2014 Working Group on California Earthquake Probabilities (WGCEP); percentage for combined rows indicates the probability for a M ≥ 6.7 earthquake anywhere along the main/parent fault.

Figure 4.7-2. Active Faults and Historic Earthquakes



Sources: Faults – USGS and CGS 2010; Shaw et al. 2002; Earthquakes – CGS 2001; USGS 2017b.

The CGS (2017) identifies the following types of hazards associated with earthquakes: ground shaking, surface fault rupture, liquefaction, landslides, and tsunamis, which are described below (seiches, which are temporary disturbances of the water level in a lake or enclosed body of water, do not apply to the Proposed Project).

Ground Shaking

Ground shaking is affected by the size of the earthquake, the type of ground earthquake waves travel through, and the distance from the earthquake source (CGS 2017). Any earthquake occurring on faults near SONGS would likely generate the largest ground motion. The intensity of earthquake-induced ground motions can be described using peak ground accelerations (PGA), represented as a fraction of the acceleration of gravity (g), which is the maximum acceleration experienced by a particle on the Earth's surface during an earthquake. The units of acceleration are commonly measured in terms of fractions of g, the acceleration due to gravity (980 centimeters/second^2).

Multiple seismic hazard evaluations and investigations have been conducted at SONGS. The most recent Seismic Hazard Assessment Analysis Report (GeoPentech 2010) calculated an earthquake return interval of 475 years for the maximum considered earthquake for a PGA of 0.44g with a 10 percent probability of exceedance in 50 years, and an earthquake return interval of 2,475 years for a maximum considered earthquake for a PGA of 0.92g with a two percent probability of exceedance in 50 years (the calculations used updated Probabilistic Seismic Hazard Analysis [PSHA] data from the Uniform California Earthquake Rupture Forecast, Version 2 [UCERF 2]). This corresponds to moderate to strong ground shaking.

Surface Rupture

Surface rupture occurs when movement on a fault breaks through to the surface (CGS 2017). Rupture may occur suddenly during an earthquake or slowly in the form of fault creep. Surface rupture almost always follows preexisting faults, which are zones of weakness; however, not all earthquakes result in surface rupture (e.g., earthquakes that occur on blind thrusts do not result in surface rupture). Fault rupture is damaging to buildings and other structures due to the differential displacement and deformation of the ground surface that occurs from the fault offset leading to damage or collapse of structures across this zone.

The closest fault to the Proposed Project is the ~~inactive~~ pre-Holocene Cristianitos Fault, located 0.25 mile south of the Proposed Project site, which is discussed above in Section 4.7.1.1, *Geology – Faults and Earthquakes (Seismicity)*. No known CGS classified active or ~~potentially active~~ NRC-classified capable faults cross or are in the immediate SONGS vicinity. The closest known active fault to SONGS site is the Offshore segment of the Newport-Inglewood fault zone, approximately 4.3 miles to the west.

Liquefaction

Liquefaction occurs when very wet soil is affected by strong ground motion (CGS 2017). Soil particles (sand and silt) shift and separate during shaking. This reduces the ability of the ground to support a structure on top of it and may cause the structure to sink and foundations to separate. Saturated, unconsolidated silts, sands, and silty sands within 50 feet of the ground surface are most susceptible to liquefaction. Liquefaction-related phenomena include lateral spreading, ground oscillation, flow failures, loss of bearing strength, subsidence, and buoyancy effects (Youd and Perkins 1978).

Groundwater levels at the Proposed Project site range from +2.5 to +7 feet, which is within the consolidated San Mateo Formation that underlies the Proposed Project site. Liquefaction would be highly unlikely to occur in the San Mateo Formation due to its consolidated nature.

Landslides and Slope Stability

A landslide is the downhill movement of ground caused primarily by gravity acting on weakened rock or soils. Events that can contribute to a landslide include erosion, ground water, human activity such as grading, earthquake vibrations, and thunder (CGS 2017). Factors that affect slope stability include slope steepness, relative strength of the underlying rock material, geologic structure (i.e., bedding, joints, or faults), and thickness and cohesion of the overlying colluvium (loose sediments deposited on or at the base of a slope). Steeper slopes or less strong rock make an area more susceptible to landslides. Steeper slopes and thicker colluvium make an area more susceptible to debris flows. The presence of old or recent landslides or debris flows is an indication of unstable slopes.

Steep coastal bluffs are located north and south of the Proposed Project site. Minor slope retreat due to erosion and wave action is present along these slopes, but no landslides or other slope failures are noted in the slopes underlain by San Mateo Formation on either side of SONGS. Existing moderate to steep slopes within SONGS are stabilized with gunite and a steel structure that is connected to the natural bluff wall/slope using tie backs, soil nails, rebar, and similar anchoring methods. The landslide-prone Monterey Formation begins approximately 0.25 mile south of SONGS and is not present on-site.

4.7.1.2 Soils

Surficial soils reflect the underlying rock type, the extent of weathering of the rock, the degree of slope, and the degree of human modification. Potential soil erosion hazards vary depending on the use, conditions, and textures of the soils. The properties of soil, which influence erosion by rainfall and runoff, are affected by the infiltration capacity of a soil and its resistance to detachment and being carried away by falling or flowing water. Soils on steeper slopes or containing high percentages of fine sands and silt, and that are low in density, are generally the most erodible. As the clay and organic matter content of

soils increases, the potential for erosion decreases. Clays act as a binder to soil particles, thus reducing the potential for wind or water erosion.

The Proposed Project site is currently almost entirely covered by impervious surfaces, such as asphalt and concrete, and was significantly graded to construct the SONGS site facilities. This grading removed most, if not all, surficial soils from the Proposed Project site; however, the near surface artificial fill and San Mateo Formation sediments contain a large percentage of sand, and terrace deposit sediments contain a mix of clay, silt, and sand. Significant gullying and erosion is present southwest of the SYFA, but historic photos indicate that these features were present before construction of Units 2 and 3 and the SYFA, and only minor increases in size and depth have appear to have accumulated since SONGS was constructed.

Expansive soils, which are typically very fine grained with a high to very high percentage of clay, are characterized by their ability to undergo substantial volume change (shrink and swell) due to variation in soil moisture content. Changes in soil moisture can result from rainfall, irrigation, utility leakage, perched groundwater, or other factors. Expansive soils may cause differential and cyclical movements of foundations and other buried structures that damage or distress structures. As indicated above, no surficial soils remain at the Proposed Project site on the surface or underlying impervious materials.

4.7.2 Environmental Setting (Coastal Processes)

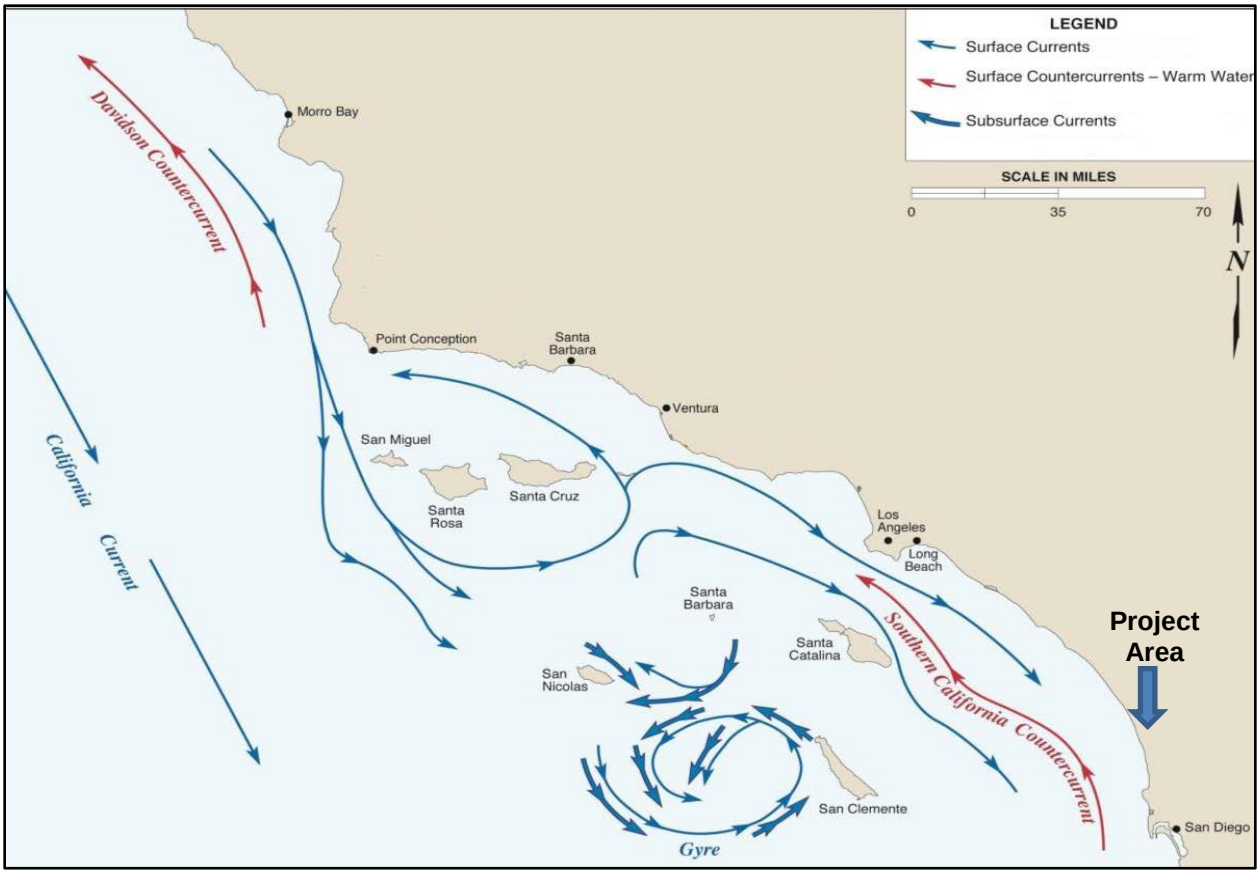
4.7.2.1 Ocean Circulation

The SONGS site is in the lower third of the Southern California Bight (SCB), a geographically defined area delimited to the north by the Santa Barbara Channel coastline and to the south by the U.S.-Mexico border (Dailey et al. 1993). South of Point Conception, temporally and spatially variable local winds, as well as the nearshore Channel Islands, promontories (raised masses of land that decline abruptly on only one side), submarine canyons, basins, ridges, and troughs introduce complexity to existing large-scale circulation patterns, leading to small-scale eddies and countercurrents (California State University Long Beach 2016). The ocean floor surrounding the SONGS intake and discharge structures is flat and minimally affected by currents. Ocean current speeds offshore of the Proposed Project area typically range from 0.1 to 0.7 foot per second during most seasons (EDAW 2005). For comparison, currents measured near La Jolla Canyon (32 miles southeast of the project site) by a gage in 400 feet of water were 0.8 foot per second, averaged over time and depth (COWI 2017). Currents near the surface were faster, averaging 1.2 feet per second. Currents generally flowed to the southeast.

Many authors have described the regional large-scale ocean currents in the study area (e.g., King et al. 2011, Dong et al. 2009, Hickey 1993, 1998, Chelton 1982). Ocean currents and circulation in the Proposed Project vicinity (see Figure 4.7-3) include the

California Current, Davidson Current, Southern California Countercurrent and seasonally variable flow patterns. The California Current is a North Pacific Ocean current setting southeastward along the west coast of the U.S., with waters characterized by seasonably stable, low salinity (32 to 34 parts per thousand [ppt]), low temperature (55 to 68 degrees Fahrenheit [°F]), and high nutrient concentrations (Center for Operational Oceanographic Products and Services 2000). The Davidson Current is a narrow, weaker countercurrent that moves water northwards between the California Current and the coasts of California, Oregon, and Washington during winter months (Center for Operational Oceanographic Products and Services 2000). The Southern California Countercurrent, which flows northward along the continental shelf, carries warm, saline, and less oxygenated waters from Baja California into the Santa Barbara Channel. The Southern California Countercurrent is strongest when the normal northwest winds relax between the months of December and February (Barth et al. no date). When the winds gain strength between March and June, the countercurrent relaxes and surface water near the coast is transported offshore and down the coast and replaced by cooler, nutrient-rich seawater from underneath. This process is referred to as upwelling.

Figure 4.7-3. Ocean Currents in Proposed Project Vicinity



Source: CSLC 2016b.

4.7.2.2 Water Levels

Water levels within the nearshore area are influenced by four primary factors: (1) climatic variation related to long-term cycles, (2) astronomical tides, (3) storm surge and wave set-up, and (4) long-term trends in sea level. The first three factors are summarized below; the last is discussed in Section 8.0*, Other Commission Considerations*.

Cyclic Climatic Variations

Large-scale coupled oceanic-atmospheric climate cycles, such as the ENSO and Pacific Decadal Oscillation (PDO), are important environmental phenomena that influence water levels. ENSO events can raise MSL by 0.3 feet in height for a year or more at a time (Coastal Environments, Inc. 2017b). ENSO anomalies on the order of 8 inches were observed to last several months in California coastal waters (Doherty et al. 2015; Hamilton et al. 2015). The PDO interacts with the ENSO to enhance or suppress ENSO effects on water levels. The PDO conditions cycle over 20- to 30-year periods, much longer than the 3- to 7-year ENSO. A cool phase of the PDO occurred between 1959 and 1975, followed by a warm phase lasting until the mid-1990s. Since the 1990s, the phases have lasted only 3 to 6 years (Mantua et al. 1997; Mantua and Hare 2002; Chavez et al. 2003; Northwest Fisheries Science Center 2016). The PDO has been in a warm phase since 2014 (Joint Institute for the Study of the Atmosphere and Ocean 2016).[42]

Tides

Tides in the Proposed Project area and along the Southern California coastline are driven by an unequal mixture of diurnal and semidiurnal elements. Typically, a lunar day (about 24 hours) consists of two high and two low tides, each of different magnitudes. A lower low tide normally follows the higher high tide by approximately 7 to 8 hours with approximately 17 hours to return to the next higher high tide (through higher low and lower high-water levels). Annual tidal peaks typically occur close to a full moon near the summer and winter solstices. A detailed description of tides and water levels is provided for the Proposed Project by Coastal Environments, Inc. (2017b). Since tide data are not available for the SONGS area, data from Scripps Pier in La Jolla, about 40 miles to the southeast were used to characterize tides at the Proposed Project location relative to common vertical datums (see Table 4.7-3).[43] Tidal benchmarks and tidal predictions are based on the most recent 19-year tidal epoch covering the period from 1983 through 2001.

[42] Derived from the sum of PDO index data for May to September 2015. Insufficient data available for 2016.

[43] These data are representative of the tides at the SONGS area since tides along the open California coast have a spatial scale on the order of 100 miles. Tide predictions are also available for Newport Harbor and the San Clemente Pier, which are closer to the Proposed Project area than La Jolla, but these values are based on correlations to the primary tide stations at La Jolla or Los Angeles. Differences between tidal characteristics at Newport and La Jolla are mostly less than 0.1 foot (Coastal Environments, Inc. 2017b).

Table 4.7-3. Tidal Characteristics at La Jolla, California

Tidal Benchmark	MLLW (feet)	NAVD88 (feet)	NGVD29 (feet)
Highest Observed (1/11/2005)	7.66	7.48	5.37
Mean Higher High Water (MHHW)	5.33	5.15	3.04
Mean High Water (MHW)	4.60	4.42	2.31
Mean Tide Level (MTL)	2.75	2.57	0.46
Mean Sea Level (MSL)	2.73	2.55	0.44
NGVD29	2.29	2.11	0.00
Mean Low Water (MLW)	0.90	0.72	-1.39
NAVD88	0.18	0.00	-2.11
Mean Lower Low Water (MLLW)	0.00	-0.18	-2.29
Lowest Observed Water Level (12/17/1933)	-2.87	-3.05	-5.16

Source: National Oceanic and Atmospheric Administration (NOAA) 2011.
Acronyms: NAVD88 = North American Vertical Datum (1988), NGVD29 = National Geodetic Vertical Datum (1929).
Notes:
[1] Bench Mark Sheet for 9410230, La Jolla.
[2] Original values provided in meters, MLLW, converted to feet NAVD88 & NGVD29.

Storm Surge and Waves

Storm surge results from storms that induce fluctuations in the wind speed and atmospheric pressure. In general, storm surge is relatively small on the West Coast of the U.S. when compared to storm surge on the East and Gulf Coasts of the U.S. The decreased impact of storm surge on the West Coast is due primarily to the relatively narrow continental shelf and limited amount of low-lying coastal land. It was estimated that the average increase in the water level resulting from storm surge effects ranges from approximately 0.3 to 0.5 foot within the San Diego coastal zone (U.S. Army Corps of Engineers [USACE] 1991). The maximum observed storm surge in Southern California occurred in February 1988, measuring 1.2 feet (Coastal Environments, Inc. 2017b). The average positive tide residual, defined as the difference between the measured and predicted tidal elevation, usually occurs on a temporal scale of approximately 6 days; however, storm surges of significant magnitudes rarely continue for longer than 2 days.

Wave setup is the super-elevation of water levels that occur primarily in the surf zone where waves break as they approach a beach and reach their limiting wave steepness. The magnitude of the wave setup depends on the height of breaking waves occurring in the surf zone. These elevated water levels allow waves of increased magnitude to impinge onto beaches, seawalls, and bluff faces during large wave events.

Waves that impinge on the shoreline, perhaps more than any other oceanographic factor, determine the fate of sediment movement and the associated impacts to the coastal environment. Essentially, waves are the driving force in generating the alongshore currents that are responsible for moving sand. Sand suspended by wave action, along the coast, ultimately results in changes to the shoreline. Wind waves and swell near the

Proposed Project area are produced by six basic meteorological weather patterns. These consist of (1) extratropical cyclone swells in the northern Pacific Ocean, (2) swells generated by northwest winds in the outer coastal waters, (3) westerly seas, (4) southeasterly seas, (5) storm swells from tropical storms and hurricanes off Mexico's coast, and (6) southerly swells originating in the southern Pacific Ocean.

Storm waves have an impact on the Southern California coast. The largest waves impacting the Proposed Project area are mainly from extratropical winter storms that, when combined with spring high tides, can cause severe beach and bluff erosion. The 1982/83 El Niño Southern Oscillation (ENSO) winter storms resulted in permanent beach sand loss in Orange County and San Diego County, that subsequently jeopardized bluff stability, as bluffs became directly exposed to storm wave attack. Accelerated bluff toe erosion occurred again after the 1997/98 ENSO season, which further stripped away the already limited beach sand. In calculating extreme waves, the USACE placed an emphasis on long period swells approaching the Proposed Project area from open wave exposure windows, as these tend to generate the greatest damage to coastal resources. Table 4.7-4 presents characteristics of deep-water waves of extreme storms, which were hindcasted and converted to extreme wave heights associated with return periods.

Table 4.7-4. Deep-water Extreme Wave Heights

Return Period (Year)	Tropical Source (feet)	Extratropical Source (feet)
10	9.8	19.3
50	13.0	25.4
100	19.6	27.8

Source: USACE 1991.

Deep-water waves entering the Proposed Project's nearshore coastal area are altered by offshore island sheltering, refraction, diffraction, and shoaling effects as they propagate towards the shoreline. The offshore Channel Islands provide some sheltering from waves approaching from the deep ocean. As waves continue to propagate shoreward, the combined effects of refraction and shoaling must be accounted for when determining the nearshore wave characteristics. As waves approach even closer to shore, wave breaking effects become significant, both increasing and then decreasing the broken wave heights. These characteristics are specific to combinations of ocean floor topography (bathymetry), swell, period, water level, location, bluff reflection, and other considerations.

COWI (2017) calculated wave characteristics at the most offshore diffuser port of Unit 2 and found that the most common waves, occurring 36 percent of the time, had significant wave heights of 2 to 3 feet, peak wave periods from 12 to 16 seconds, and came from the south-southwest. Table 4.7-5 shows the extremal analysis wave heights for the same location. Wave heights change (increase or decrease) during transformation from offshore to nearshore.

Table 4.7-5. Extreme Wave Heights at Unit 2 Offshore Diffuser

Return Period (Year)	Wave Height (feet)
1	5.8
10	10.1
50	12.0

Source: COWI 2017.

Coastal Environments, Inc. (2017b) published measured wave characteristics from a location in 33 feet of water offshore of the Proposed Project site. Results are generally in agreement with the above wave characteristics. For example, typical significant wave heights mostly varied between 2 to 4 feet and peak wave periods mostly ranged from 12 to 15 seconds.

Tsunamis

A tsunami (the Japanese word for harbor wave) is a long period waves or a series of waves in a water body generated by a large underwater disturbance, such as an earthquake, volcanic eruption, or landslide. Waves produced by tsunamis can move at a rate exceeding 500 miles per hour (CGS 2017) and typically have a wavelength in excess of 100 miles with an amplitude of 3 feet or more (USACE 2015). The waves resulting from a tsunami can be significantly amplified by shoaling, diffraction, refraction, convergence, and resonance as they approach the coastline.

Historically, tsunamis have not significantly affected the Proposed Project area and local earthquake events are not expected to produce underwater disturbances capable of generating significant tsunamis within this coastal region (USACE 2015). According to the National Oceanic and Atmospheric Administration (NOAA) Center for Tsunami Research (2016), the 2010 Chilean and 2011 Japanese tsunamis yielded maximum wave amplitudes of 0.8 feet at La Jolla and 1.2 feet at the Los Angeles Outer Harbor tide gages.

Kirby and Shi (2013) calculated maximum probable tsunami inundation elevations for SONGS. Their calculations, which assumed 13 inches of sea-level rise in the base water level, yielded a maximum wave run-up of 22 feet above MLLW at the SONGS seawall, which has a crest elevation of 30 feet MLLW. Kirby and Shi (2013) concluded that these tsunami run-up elevations are not sufficient to inundate SONGS Unit 1, 2, or 3 areas.

4.7.2.3 Littoral Processes

The coastal zone of the Proposed Project area is located within the Oceanside Littoral Cell, which extends approximately 51 miles along the coast, bounded on the north by Dana Point Harbor and the south by Point La Jolla. This littoral cell contains a wide variety of coastal features including coastal cliffs, headlands, beaches composed of sand or cobbles, rivers, creeks, tidal lagoons, and marshes, submarine canyons, human-made shore and bluff protection devices, and major harbor structures. Within the littoral cell, the shoreline mostly consists of narrow sandy beaches backed by high sea cliffs. During the past 20 years or so, the backshore and bluff tops of this cell have experienced rapid residential and commercial development, and artificial beach nourishment has been performed periodically at many locations.

The net longshore sediment transport rate over the time period from 1978 to 1994 near the Proposed Project Site was calculated by Coastal Environments, Inc. (2017b) to be

about 51,000 cubic yards per year to the south. The net transport represents the difference between southerly and northerly gross transport. Over the period from 1940 to 2005, the long-term average gross longshore sediment transport rate has been approximated as roughly 740,000 cubic yards per year flowing southward and 550,000 cubic yards per year flowing northward. The net longshore sediment transport rate has been variously estimated as being between 146,000 to 194,000 cubic yards per year, flowing southward (Patsch and Griggs 2007). The large difference between the Coastal Environments, Inc. (2017b) net transport and Patsch and Griggs (2007) net transport results from the variability over differing time scales and from differing calculation methods. The longer-term net sediment transport rate, covering 1940 to 2005 was used for the current analysis.

Dana Point Harbor acts as a relatively impermeable barrier to up-coast littoral material. Since construction in 1970, Dana Point Harbor has been dredged only once, which occurred in 2009. Just down-coast of Dana Point Harbor, San Juan Creek enters the ocean, and sandy beaches begin to appear. Littoral drift carries this sand southward before joining with sand from San Mateo Creek and Santa Margarita River. Combined, these fluvial sources add approximately 80,000 cubic yards per year of sand to the littoral system (Patsch and Griggs 2007). Seacliff, gully, and upland terrace erosion from this stretch of coast provides an additional 100,000 cubic yards per year of sand. Artificial beach nourishment provides an additional 110,000 cubic yards per year of sand to the littoral budget. These sand sources combine to supply this stretch of the Oceanside Littoral Cell with approximately 290,000 cubic yards per year of sand (Patsch and Griggs 2007). Longshore transport carries this sand past the Proposed Project area and deposits it in sediment sinks such as the Oceanside Harbor, an offshore bar near Oceanside Harbor, and the La Jolla and Scripps Submarine Canyons.

Changes in shoreline position can be estimated using beach profile data, aerial photographs, and Light Detection and Ranging (LIDAR) surveying. A broad array of beach and nearshore survey data are detailed by Coastal Environments, Inc. (2017b). Beach profiles were surveyed at the Proposed Project area by the USACE from 1983 through 1989, providing a snap shot of conditions during that period. The USACE (1991) also collected aerial photographs of the Proposed Project area from 1938 through 1988.

The USACE summarized their beach profile data for the Proposed Project area by concluding that the mostly undeveloped reach appears to be relatively stable with localized beach widening (i.e., accretion) and beach narrowing (i.e., erosion) during short durations. No long-term trends were visible during their 1940 to 1989 observation period (USACE 1991). Hapke et al. (2006) found the shoreline change rate from the 1800’s to 2002, near the Proposed Project area, to be between +1.6 to -1.0 feet per year, depending on the alongshore location.

This relative stability is substantiated by the lack of Coastal Sediment Management Workgroup (2010) listings for Beach Erosion Concern Areas at or near the Proposed Project area, which indicates that area beaches are not of concern to state, federal, or local entities for having current or historical erosion. The nearest Beach Erosion Concern Area to the Proposed Project area is in San Clemente.

Seasonal variations in beach width occur within the Oceanside Littoral Cell. During the winter season, when the wave environment is energetic, sediment is transported from the beach area and stored in an offshore bar formation. These sands then return to the beach throughout the summer when a more benign wave environment is present. Therefore, the largest changes in beach width are typically measured between the fall and spring. The USACE beach profile data indicate that the beach near the Proposed Project area experienced a maximum seasonal shoreline change of 105 feet (USACE 1991). A loss of beach width of this magnitude, when combined with the already narrow beaches, has led to the occasional disappearance of many of the sandy beaches within this cell.

Scripps Institution of Oceanography (SIO) has been surveying the beaches since 2002 using LIDAR, personal watercraft, all-terrain vehicles, and hand-pushed dollies (SIO 2016). Using their LIDAR data, SIO observed that the seasonal, fall to spring, change in MSL beach width near the Proposed Project area during the 2002 to 2006 period typically varied only 32 feet (Yates et al. 2009). This agrees well with the roughly 33-foot average seasonal beach width changes around the Proposed Project site from 1991 through 1993 (Coastal Environments, Inc. 2017b). This is a small change compared to other locations in the Oceanside Littoral Cell. This is a substantial change relative to the average beach width, which is approximately 200 feet (USACE 1991). This beach width represents the average distance at the USACE survey transect identified as “SO 1530” from the back beach to the beach berm from five surveys dating 1983 through 1987.

4.7.3 Regulatory Setting

Relevant federal and state laws, regulations, and policies are summarized in Appendix A. Local laws, regulations, and policies are discussed below. Although the Proposed Project site is within San Diego County, it is under the jurisdiction of the Department of the Navy (DoN) and California Coastal Commission (CCC).

4.7.3.1 County of San Diego

The County of San Diego does not have direct jurisdiction or permit authority over the Proposed Project; however; its plans related to recreation and public access are summarized below. The County Department of Public Works, Land Development Division provides engineering, review services, and oversight for construction and development projects throughout unincorporated areas of the county. Regulations and requirements for grading within San Diego County are outlined in the San Diego County Grading Ordinance. All grading in the county must be completed in accordance with approved

plans and permits. Work that involves movement of more than 5,000 cubic yards of material must be done under the supervision of a civil engineer. To assure that work is being adequately supervised, the County requires submission of reports at least once a month and also during any week in which more than 200 cubic yards of material is moved.

4.7.3.2 Coastal Regional Sediment Management Plan (CRSMP)

The California Coastal Sediment Management Workgroup has teamed with local governments to develop local CRSMPs. The San Diego CRSMP (Moffatt & Nichol et al. 2009) only covers the coast from Oceanside to the Mexican border, so is not applicable to the Proposed Project. The Orange County CRSMP (Everest International Consultants, Inc. 2013) includes all of Orange County down to the county line at San Mateo Creek, which is 2 miles north-northwest of the Proposed Project area. While there are no specific projects within the Orange County CRSMP that apply directly to the Proposed Project area, some of those efforts may result in changes to the shoreline at SONGS through longshore transport of littoral sediment from Orange County.

4.7.4 Significance Criteria

The significance criteria used to evaluate the Project impacts to geology and soils are based on Appendix G of the State CEQA Guidelines. According to Appendix G of the State CEQA Guidelines, a significant impact would occur if the Project would:

- Result in substantial adverse effects involving rupture of a known earthquake fault
- Result in substantial adverse effects from seismically induced ground shaking or seismically induced ground failures such as landslides or liquefaction related phenomena
- Exacerbate any existing geologic hazard
- Cause substantial adverse effects related to construction triggered slope instability, such as landslides
- Result in construction-triggered or accelerated soil erosion or loss of topsoil

Impacts to coastal processes are considered significant if the Proposed Project would:

- Impair nearshore sediment properties, characteristics, or processes including changes to bluff, beach, or nearshore resources, and sediment transport. This includes changes to: longshore and cross shore sediment transport; wind transport of sediment; bluff contributions, increased or decreased bluff erosion; beach narrowing and shoreline erosion; and beach or nearshore profile steepening
- Result in changes to nearshore wave, water current, or water circulation properties, characteristics, or patterns

- Increase in tsunami induced impacts to human life, property, and environmental resources

4.7.5 Environmental Impact Analysis and Mitigation

The Proposed Project's decommissioning activities and associated impacts would be due to dismantling or excavation of the upland, shoreline, and near-shore areas, and disturbance of offshore and nearshore sediments, including tsunami-induced impacts. Geologic formations, slope conditions, and soil types have been characterized by their potential to be adversely impacted by Proposed Project activities. A wide range of potential impacts, including erosion, expansive soils, slope instability, seismic hazards of surface fault rupture, strong ground shaking, liquefaction, and seismically induced landslides, were considered in this analysis. Areas prone to risk for potential adverse impacts due to existing geologic, topographic, or soils conditions were identified and their relationship to Proposed Project activities analyzed. This analysis also considers the potential to impair coastal sediment properties; degrade water wave, current, or circulation patterns; and increase tsunami threats. Table 4.7-62 provides a summary of the Proposed Project's potential impacts related to geology, soils, and coastal processes; all impacts are less than significant.

ENVIRONMENTAL IMPACT ANALYSIS

Impacts of the proposed Project and recommended mitigation measures (MMs) are examined in this section. Consistent with CBIA v. BAAQMD (62 Cal. 4th 369, 386; see the introduction to this section), this EIR evaluates potential significant impacts of the Proposed Project on the environment, not vice versa (i.e., not the impacts of an earthquake, tsunami, or other existing geologic-related hazard on the Proposed Project or on SNF stored at SONGS). Therefore, the Proposed Project would not create impacts related to the following criteria (listed in Section 4.7.4, *Significance Criteria*), which would result in impacts to the Proposed Project rather than impacts from the Proposed Project. As such, impacts related to these CEQA criteria were not evaluated in detail and are not discussed further beyond the summaries below:

- **Results in substantial adverse effects involving rupture of a known earthquake fault.** The closest fault to the Proposed Project is the inactive pre-Holocene Cristianitos Fault, located 0.25 mile south of the Proposed Project site. No known CGS defined active faults or potentially activeNRC-defined capable faults cross or are in the immediate SONGS vicinity, thus there is no potential for surface fault rupture at or across the site. There would be no potential for surface fault rupture at the Proposed Project site, and therefore, no surface fault rupture risks would be exacerbated by Proposed Project activities.
- **Results in substantial adverse effects, including the risk of loss, injury, or death from seismically induced ground shaking.** The Seismic Hazard

Assessment Analysis (GeoPentech 2010) indicated maximum PGAs of (1) 0.44g with a 10 percent probability of exceedance in 50 years and (2) 0.92g with a 2 percent probability of exceedance in 50 years (earthquake return intervals of 475 and 2,475 years, respectively, for a maximum considered earthquake) could occur at the Proposed Project site. These PGA values correspond to moderate to strong ground shaking, which could cause damage to structures; however, no new structures are being constructed as part of the Proposed Project.

- **Results in substantial adverse effects, including the risk of loss, injury, or death from seismically induced ground failures such as landslides or liquefaction related phenomena.** A large local or regional earthquake could cause moderate to strong ground shaking; however, seismically triggered landslides or liquefaction phenomena would be highly unlikely to occur. As noted above in Section 4.7.1.1, *Geology – Landslides and Slope Stability*, steep coastal bluffs are located both north and south of the Proposed Project site; however, no known landslides exist in the bluffs immediately adjacent to the site. Existing moderate to steep slopes within SONGS are stabilized with gunite and a steel structure that is connected to the natural bluff wall/slope using tie backs, soil nails, rebar, and similar anchoring methods. The offshore and nearshore portions of the Proposed Project site are flat to gently sloping and would not be subject to seismically induced slope stability. Additionally, grading within the SONGS site as part of the Proposed Project would be conducted per accepted engineering standards and in compliance with local and DoN grading requirements, thereby reducing the potential for earthquake induced landslides to negligible.

  As noted above in Section 4.7.1.1, *Geology - Liquefaction*, groundwater levels at the Proposed Project site are located within the consolidated San Mateo Formation, and liquefaction would be highly unlikely to occur in the San Mateo Formation due to its consolidated nature. Therefore, the potential for liquefaction related damage at the Proposed Project site is negligible.

- **Exacerbates a Geologic Hazard (Exposure of Expansive Soils to Moisture).** No surficial soils remain at the Proposed Project site at the surface or underlying the impervious materials; the near surface terrace deposits contain a mix of clay, silt, and sand. The clayey sediments in the terrace deposits may be subject to expansion when exposed to water or moisture with the removal of the overlying impervious materials. However, as no new above or below ground structures are planned as part of the Proposed Project, the Proposed Project would not exacerbate any geologic hazards relating to the potential presence of expansive soils/materials in the areas underlain by clayey marine terrace deposits ~~would not result in any impact to the Proposed Project~~.

Impact GEO/CP-1: Construction Triggered Landslides.

Grading and excavation for removal of SONGS facilities and associated structures would not trigger landslides **(No Impact).**

Impact Discussion

Steep coastal bluffs are located both north and south of the Proposed Project site. Minor slope retreat due to erosion and wave action is present along these steep slopes, but no landslides of other slope failures are noted in the slopes underlain by San Mateo Formation on either side of SONGS. Grading and excavation for removal of the Units 2 and 3 facilities and impervious surfaces, including roads and parking areas, as part of the Proposed Project would not affect these slopes and would not trigger slope instability along the bluffs. The existing moderate to steep slopes within SONGS are stabilized with gunite and anchors connected to the natural bluff wall/slope, and would not be removed as part of the Proposed Project as discussed in Section 2.3.14, *Site Conditions at End of Proposed Project*. All grading and excavation within the SONGS site as part of the Proposed Project would be conducted per accepted engineering standards and in compliance with ~~local and DoN grading~~state agency requirements and stabilization conditions per the SWPPP (See APM-12). Nearshore and offshore work would occur on the flat to gently sloping sea bottom and would not be subject to slope stability issues. This results in a negligible potential for construction triggered landslides throughout and adjacent to the Proposed Project area. As such, there would be no impact.

Mitigation Measures

No MMs are recommended for Impact GEO/CP-1.

Impact GEO/CP-2: Construction Triggered Erosion.

Removal of surface impervious material, and grading and excavation could trigger erosion of loose sediments **(Less than Significant Impact).**

Impact Discussion

Sediments loosened by excavation and grading and stockpiled excavated sediments would be subject to erosion by wind and water. Materials would be excavated to depths of 6 inches in all paved areas to be removed and a minimum of 3 feet around major structures; excavations may be deeper to remove utilities and to remove the underground fuel storage tanks, auxiliary boiler fuel oil tanks, and the oily waste sump. The estimated volume of soil to be excavated is approximately 1,458,000 cubic feet (see Section 2.3.2.3, *General Approach to Structure Demolition*).

Because the Proposed Project would disturb a surface area greater than 1 acre, the SONGS Decommissioning General Contractor would obtain or amend a National Pollutant Discharge Elimination System General Permit for Storm Water Discharges Associated with Construction Activity and prepare or update a Project Stormwater Pollution Prevention Plan (SWPPP). Best management practices for erosion and runoff control would be required as part of the SWPPP, which would reduce any issues related to erosion to negligible. In its Applicant-proposed measures (APMs; see Table 4-2, *Applicant-Proposed Measures*), SCE commits to preparing the SWPPP to ensure that impacts to erosion would be minimized.

APM-12: Stormwater Pollution Prevention Plan (SWPPP) (Section 4.9, *Hydrology and Water Quality*).

With implementation of APM-12, the less-than-significant impact related to erosion would be further reduced.

Potential interim erosion impacts that could occur between the Proposed Project and prior to final site restoration are discussed under Impact WQ-4 in Section 4.9, *Hydrology and Water Quality*.

Mitigation Measures

No MMs are recommended for Impact GEO/CP-2.

Impact GEO/CP-3: Impaired Coastal Sediment Properties.

Opening the conduits to sediment infilling from the littoral system could result in a loss of sediment from the littoral system **(Less Than Significant).**

Impact Discussion

Proposed Project activities that have the potential to impair coastal sediment properties include removal of the conduit structures, and opening the conduits to infilling of sediments.

As described in Section 2.3.6, *Offshore ~~Conduit Disposition and Related~~ CSLC Lease Offshore ~~a~~Activities*, offshore dispositioning includes partial removal of the vertical structures associated with the intake and discharge system such as the manhole risers and a subset of the discharge diffuser ports. Some naturally accumulated sediment, stone blankets, and backfill would be dredged at each conduit to access and remove the structures. Each hole left by the removed structure would then be covered with mammal exclusion barriers, which would function to keep humans and large marine organisms out of the conduits, while allowing water and sediment in. While the Unit 2 diffuser ports and manhole risers would be removed, the Unit 2 discharge conduit would be maintained in place for use throughout the Proposed Project (and Future Activities) to allow for

dewatering and other discharges. To minimize sediment intrusion into the conduit, solid covers would be placed on top of the mammal exclusion barriers.

The entire void volume of the intake conduits, Unit 3 discharge conduit, and fish return conduits is approximately 150,000 cubic yards. This value was calculated based on the stated conduit dimensions provided in Section 2.3.6, *Offshore ~~Conduit Disposition and Related Activities~~ CSLC Lease Offshore Activities*, and does not include the Unit 2 discharge conduit. Large portions of the conduits would likely remain unfilled and the actual volume of sand lost from the littoral system would be much less. In fact, the volume of sand infilling the conduits was estimated to be approximately 13,800 cubic yards (COWI 2017).[44] This smaller volume is mostly due to sediment falling into the conduit would form a cone shape that would block the ingress of sediment preventing total filling of the conduit. This loss of sediment would be expected to occur over a time period ranging from one month to 100 years after installation of the mammal exclusion barriers.

According to Table 2-6, Estimated Disturbance Areas and Dredge Volumes, the dredging necessary to access the conduit structures totals approximately 1,156 cubic yards of combined accumulated sediment, stone blanket, and backfill, which is proposed to be sidecast 15 to 20 feet from the conduit centerline, thus staying within the overall littoral system. Some of the sidecast dredged material would ultimately migrate back to the disturbance area along with additional material supplied from the littoral system. This dredging would have zero net impact to the littoral volume.

Theoretically, a loss of sediment from the littoral system could cause localized beach erosion. For an estimate of the changes to the beach, sediment volume loss from the Proposed Project were compared to nourishment volumes from the San Diego Association of Governments (SANDAG) Regional Beach Sand Project II (Coastal Frontiers Corporation 2016). SANDAG placed 89,000 cubic yards of sand at Cardiff Beach in the fall of 2012 (Coastal Frontiers Corporation 2016). Monitoring showed beach widening of more than 50 feet directly after placement, returning to the pre-nourishment beach width within one year (Coastal Frontiers Corporation 2016). Yearly comparisons are necessary for determining changes to beach width to mask large seasonal changes in beach width that typically occur. As such, the Cardiff Beach nourishment effectively had no measurable impact on beach width. Since the Cardiff Beach nourishment, with 89,000 cubic yards of sand, registered no impact on beach width, losing 13,800 cubic yards of sand as part of the Proposed Project would not register a measurable beach narrowing. If there is any beach narrowing associated with the Proposed Project, then it would be small and spread over up to 100 years. In all likelihood, it would not be measurable, neither in the bathymetry nor in beach widths.

[44] This is the larger of Option 1 and Option 2 from the COWI (2017) report. It includes all of Unit 3 volume (11,100 cubic yards) and only a portion of Unit 2 volume (2,700 cubic yards), excluding the Unit 2 discharge conduit infilling (11,100 + 2,700 = 13,800 cubic yards).

The small volume of sediment loss from modifying the conduits is not likely to measurably change bluff, beach, or nearshore sediment resources or nearshore longshore sediment transport rates and other characteristics, as this is typically associated with large ranges of uncertainty, over large spatial ranges and over multi-decadal time scales (Patsch and Griggs 2007). The Proposed Project would not have noticeable or measurable influence on cross shore sediment transport, wind transport, bluff erosion, bluff sediment contributions, nearshore, or beach slopes. The conduit structure modifications would have a less-than-significant impact to coastal sediment properties.

Mitigation Measures

No MMs are recommended for Impact GEO/CP-3.

Impact GEO/CP-4: Degrade Water Wave, Current, or Circulation Patterns.

Removal of concrete vertical risers supporting the conduits could have effects on water waves, currents, and circulation patterns **(Less Than Significant).**

Impact Discussion

Physical changes to bathymetry induce changes in wave propagation and ocean current patterns. Changes to wave refraction, shoaling, and diffraction patterns as waves propagate over the seafloor can lead to observable changes in wave breaking locations, wave breaker types, and wave breaking directions. Changes can be small to the point of being undetectable; others can be large enough to be noticed and induce secondary effects, such as changes in surfing conditions and longshore sediment transport patterns.

According to Table 2-6, the total combined seafloor changes from the Proposed Project is approximately 46,800 square feet (1.075 acres) compared to the total seafloor area from the discharge conduits to shore over which changes would occur (approximately 6 million square feet). The Proposed Project changes would affect approximately 0.8 percent of the seafloor over which waves would propagate. With such small changes, waves propagating to shore are not likely to change noticeably from the existing condition, both immediately after construction and continuing in perpetuity. By similar reasoning, the small changes occurring over a large area are not expected to noticeably modify ocean currents at or near the Proposed Project area, either during or after decommissioning.

Proposed Project modifications to the conduit structures would have less-than-significant impacts to water wave, current, and circulation patterns.

Mitigation Measures

No MMs are recommended for Impact GEO/CP-4.

Impact GEO/CP-5: Increased Tsunami Threats.

Modifying conduit structures would slightly change ocean conditions, but not enough to measurably change tsunami inundation properties **(No Impact).**

Impact Discussion

The largest structures to be removed as part of the conduit structure modifications are the primary offshore intake structures, measuring 32 feet in diameter. Combining all the conduit structure modifications yields an area of approximately 46,700 square feet. Assuming this area is the shape of a square, one side would be 216 feet long, which can be used to represent the offshore distance over which bottom changes would occur. For a tsunami traveling towards shore with a wavelength on the order of 100 miles (see Section 4.7.2.2, *Water Levels – Tsunamis*), a bathymetric change of 216 feet would not be "felt" by the tsunami wave. This is verified by the tsunami models developed at the Proposed Project area, both of which use a minimum grid resolution of 300 feet (Wilson et al. no date; Kirby and Shi 2013). Being much smaller than the minimum resolution necessary for model input, the Proposed Project changes would not modify tsunami model results nor change real life tsunami characteristics. Given the scale of the proposed change, there would be no impact from the proposed conduit structure modifications on tsunamis.

Mitigation Measures

No MMs are recommended for Impact GEO/CP-5.

4.7.6 Cumulative Impacts

As discussed in Section 3.2, *Relevant Cumulative Projects*, and shown in Table 3-2, 11 reasonably foreseeable cumulative projects fall within the geographic area near SONGS considered for potential cumulative impacts related to geology, soils, and coastal processes. Seismic impacts (such as ground shaking and earthquake-induced slope failure) from the numerous local and regional faults comprise an impact of the geologic environment on individual projects and would not introduce cumulatively considerable impacts. Impacts from unsuitable soils (expansive or corrosive soils) would also represent an impact of the environment on individual projects and would not be cumulatively considerable.

The Proposed Project would not result in any permanent significant impacts to coastal processes. The Proposed Project would result in negligible losses of sediment from the littoral system totaling 13,800 cubic yards over 100 years, or an average of approximately 138 cubic yards per year. In comparison to the net longshore sediment transport rate of between 146,000 to 194,000 cubic yards per year flowing southward (see Section 4.7.2.3, *Littoral Processes*), sediment loss from the Proposed Project is negligible.

The San Clemente Beach Replenishment Project began in 2016 (see ID No. 41 in Table 3-2), and includes nourishment of approximately 251,000 cubic yards of sand every 6 years for a duration of 50 years (USACE 2011). This quantity works out to an average of approximately 42,000 cubic yards of sediment per year added to the littoral system. This project is currently increasing sand in the littoral system that will eventually drift to and through the Proposed Project area. This additional sand is approximately 20 to 30 percent of the net longshore sediment transport rate, which is significant, and will likely have a measurable effect on the shoreline and beach widths within the littoral system. Comparing the magnitude of sediment loss from the Proposed Project (138 cubic yards per year) to the 42,000 cubic yards per year sediment gain from the San Clemente Beach Replenishment Project, the loss from the Proposed Project is negligible. Also, the effects on the coastal sediment properties from the Proposed Project and the San Clemente Project oppose one another and are therefore not cumulative.

The City of Dana Point's Opportunistic Beach Fill Program (Cumulative Project ID No. 32) has provided beach nourishment at two sites: (1) Baby Beach in Dana Point Harbor, and (2) Capistrano Beach County Park (USACE 2014). The Capistrano Beach County Park nourishment site is within the same littoral cell as the Proposed Project and has the potential to add sand to that littoral system, potentially benefiting the beach and nearshore area at the Proposed Project area. The last time this beach was nourished under this program it received 65,000 cubic yards of sand in the spring of 2016 (Dana Point Times 2016). There is no subsequent nourishment planned for this location. As the beach nourishment quantity is small and the effects will diminish over distance and with time, any cumulative impacts with the Proposed Project will likely be lost within the background environmental noise and therefore be negligible. Also, the effects on the coastal sediment properties from the Proposed Project and the City of Dana Point's Opportunistic Beach Fill Program oppose one another, and are therefore not cumulative.

The Agua Hedionda Routine Maintenance Dredging (ID No. 26 in Table 3-2) places sand on the beach in the same littoral cell as the Proposed Project. However, sand nourishment at beaches near Agua Hedionda Lagoon has little chance of migrating the 20 miles up-coast, against the dominant longshore sediment transport direction, and around Oceanside Harbor to the Proposed Project area. Thus, the nourishment would not add to cumulative coastal processes impacts at the Proposed Project area.

The Proposed Project's changes to the littoral sand supply are negligible and less than significant. The Proposed Project would have negligible effects on water waves, currents, circulation patterns, and tsunami threats, and no cumulative effects with other listed coastal projects. Therefore, the Proposed Project would not make a considerable contribution to cumulative effects associated with coastal processes.

Geologic hazard and soils impacts (e.g., slope instability [landslides] and soil erosion) are typically site-specific. The impacts of each past, present, and reasonably foreseeable

project would be specific to the site and would not impact other sites. In addition, development of each site would be subject to site development and construction guidelines and standards (local, state, and federal) designed to protect public safety. Adverse geologic conditions would have to occur at the same time and in the same location as at the Proposed Project to be cumulatively considerable. The cumulative projects highlighted in the above discussion are near the Proposed Project, but would not be coincident with the same location at the same time. Therefore, adverse impacts related to geology and soils from the Proposed Project would not be cumulatively considerable.

4.7.7 Future Activities

4.7.7.1 Riprap

Implementation of SONGS Decommissioning Future Activities related to removal of the Approved ISFSI could result in onshore impacts that are similar to those discussed for the Proposed Project. DoN approval would be required at a later point in time, as well as issuance of a Coastal Development Permit amendment by the CCC in 2035. At the time of these approvals, final end-state conditions for the existing seawall, public walkway, gunite slope protection, and shoreline rock riprap would be made.

As proposed, the Applicant would remove exposed rock riprap to -2 feet MLLW which would not likely create any new geology or soils impacts. If the DoN and CCC determine that the existing shoreline rock riprap or seawall should be removed, significant adverse impacts related to erosion of the previously disturbed areas could occur; however, at this time, the significance of these impacts cannot be determined without speculation.

Removing part or all the riprap, walkway, seawall, and gunite slope protection would partially or fully restore bluff erosion rates and patterns to a more natural state. As described in a letter report from Coastal Environments submitted in May 2017, remaining substructures directly beneath and seaward of the seawall are expected to become further buried after the seawall is removed (SCE 2018h). Compared to the baseline condition, ocean waves would interact with the bluffs after removal of the shore protection structures (e.g., riprap, seawall) thus increasing bluff erosion rates. With a fixed back beach, such as with a riprap or seawall, future sea-level rise is expected to make beaches increasingly narrow (CCC 2015b). Removing the beach fixing structure, in this case the riprap and seawall, would allow the back of the beach to migrate landward in the same direction as the migrating shoreline, thus preserving the beach width to some extent. How fast the shoreline would migrate landward with sea-level rise, and how fast the bluff would erode are currently a matter of research and are as yet undetermined.

On highly developed coastlines, increased bluff erosion is considered detrimental due to the loss of blufftop land. However, in more natural and undeveloped coastlines, restoring more natural bluff erosion processes (often increasing bluff erosion) is seen as beneficial, restoring the natural coastal sediment sources, grain size gradations, and supplies to

beaches. In undeveloped coastlines, the loss of blufftop land is of secondary importance in comparison to restoring coastal processes. While the Proposed Project area is relatively stable, the larger littoral cell that includes the Proposed Project area has historically experienced a shortage of beach sand (Hapke et al. 2006; Everest International Consultants, Inc. 2013; USACE 2011), so any additional input from bluff sources is considered beneficial. If erosion impacts from these Future Activities are found to be significant, the implementation of MMs may be appropriate. However, overall, removing all or part of the riprap, walkway, and seawall would be a beneficial impact to the environment and coastal processes.

4.7.7.2 Offshore Conduit Components

Future Activities would occur after 2035. According to Section 2.4.3, *Independent Spent Fuel Storage Installation Removal and Final Site Restoration*, once the Unit 2 discharge conduit is no longer needed for dewatering or other Future Activities, the solid covers would be removed, leaving the mammal exclusion barriers in place. Removal of the Unit 2 covers would allow natural infilling of the Unit 2 discharge conduit by an additional 8,800 cubic yards of sediment over a 1-month to 100-year time period (COWI 2017).[45] Adding 8,800 cubic yards to the previously determined 13,800 cubic yards of infill brings the total infill volume to approximately 22,600 cubic yards. This increases the time averaged infill rate from 138 cubic yards per year, to 226 cubic yards per year, which is still much less than the net longshore sediment transport rate of 146,000 to 194,000 cubic yards per year flowing southward (for detailed discussion, see Section 4.7.6, *Cumulative Impact Analysis*). Also, if required by the Commission, remaining discharge conduit diffuser ports would be removed, and solid covers installed on the remaining openings to minimize potential impacts to the surrounding sediment/sand supply.

4.7.8 Summary of Proposed Mitigation Measures

Table 4.7-6 provides a summary of the mitigation and Applicant-proposed measures.

Table 4.7-6. Geology, Soils, Coastal Processes Impact/Mitigation Summary

Impact	MM/APM
GEO/CP-1: Construction Triggered Landslides	None recommended
GEO/ CP-2: Construction Triggered Erosion	APM-12: Stormwater Pollution Prevention Plan (SWPPP)
GEO/CP-3: Impaired Coastal Sediment Properties	None recommended
GEO/CP-4: Degraded Water Wave, Current, or Circulation Patterns	None recommended
GEO/CP-5: Increased Tsunami Threats	None recommended

[45] From COWI (2017) Table F-3 maximum Option 2 infill volume is calculated as: 11,500 cubic yards (Unit 2) + 11,100 cubic yards (Unit 3) = 22,600 cubic yards. Excluding the Unit 2 discharge conduit, infill volume is calculated as: 2,700 cubic yards (Unit 2) + 11,100 cubic yards (Unit 3) = 13,800 cubic yards. The additional 8,800 cubic yards of infill occurring after 2035 is calculated as: 11,500 – 2,700 = 8,800 cubic yards.

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4.8 GREENHOUSE GAS EMISSIONS

This section evaluates the potential for the Proposed Project to generate greenhouse gas (GHG) emissions, either directly or indirectly, within the Proposed Project area. Potential air quality impacts are discussed in Section 4.3, *Air Quality*. The section begins with a discussion of GHG science and the existing GHG setting within the Proposed Project area. Following that discussion, the section identifies applicable significance thresholds, assesses potential impacts associated with GHG emissions (e.g., from Proposed Project activities, equipment, and scheduling) and their significance, and recommends measures to avoid or substantially reduce any effects found to be potentially significant.

4.8.1 Environmental Setting

4.8.1.1 Introduction

GHGs are defined as any gas that absorbs infrared radiation in the atmosphere. GHGs include, but are not limited to, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), and nitrogen trifluoride (NF_3). These GHGs lead to the trapping and buildup of heat in the atmosphere near the earth's surface, commonly known as the greenhouse effect. There is overwhelming scientific consensus that human-related emissions of GHGs above natural levels have contributed significantly to global climate change by increasing the concentrations of the gases responsible for the greenhouse effect, which causes atmospheric warming above natural conditions.

According to the National Oceanic and Atmospheric Administration (NOAA), the atmospheric concentration of CO_2 measured at Mauna Loa, Hawaii in December 2017 was 406.82 parts per million (ppm) (NOAA 2017a) compared to the pre-industrial levels of 280 ppm +/- 20 ppm (Intergovernmental Panel on Climate Change [IPCC] 2007). NOAA's Mauna Loa data also show that the mean annual CO_2 concentration growth rate is accelerating, where in the 1960s it was about 0.9 ppm per year and in the first decade of the 2000s it was almost 2 ppm per year, and from May 2015 to May 2016 it was nearly 4 ppm. Because GHG emissions are known to increase atmospheric concentrations of GHGs, and increased GHG concentrations in the atmosphere exacerbate global warming, a project that adds to the atmospheric load of GHGs adds to the problem. To avoid disruptive and potentially catastrophic climate change, annual GHG emissions must not only stabilize, but must be substantially reduced. The impact to climate change due to the increase in ambient concentrations of GHGs differ from criteria pollutants (see Section 4.3, *Air Quality*), in that GHG emissions from a specific project do not cause direct adverse localized human health effects. Rather, the direct environmental effect of GHG emissions is the cumulative effect of an overall increase in global temperatures, which in turn has numerous indirect effects on the environment and humans.

The IPCC completed a Fifth Assessment Report (AR5) in 2014 that contains information on the state of scientific, technical, and socio-economic knowledge about climate change. The AR5 includes working group reports on basics of the science, potential impacts and vulnerability, and mitigation strategies.[46] Global climate change has caused physical, social, and economic impacts in California, such as land surface and ocean warming, decreasing snow and ice, rising sea levels, increased frequency and intensity of droughts, storms, and floods, and increased rates of coastal erosion. In its Climate Change 2014 Synthesis Report, which is part of the AR5, the IPCC (2014) notes:

> *Human influence on the climate system is clear, and recent anthropogenic emissions of greenhouse gases are the highest in history. Recent climate changes have had widespread impacts on human and natural systems…warming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia. The atmosphere and ocean have warmed, the amounts of snow and ice have diminished, and sea level has risen.*

The potential of a gas or aerosol to trap heat in the atmosphere is called global warming potential (GWP). The GWP of different GHGs varies because they absorb different amounts of heat. CO_2, the most abundant GHG, is used to relate the amount of heat absorbed to the amount of the gas emissions; this is referred to as CO_2 equivalent (CO_2e). CO_2e is the amount of GHG emitted multiplied by the GWP. The GWP of CO_2, as the reference GHG, is 1. Methane has a GWP of 25; therefore, 1 pound of methane equates to 25 pounds of CO_2e. Table 4.8-1 shows a range of gases with their associated GWP, their estimated lifetime in the atmosphere, and the GWP over a 100-year timeframe (per federal and state reporting requirements).

Table 4.8-1. Global Warming Potential of Various Gases

Gas	Life in Atmosphere (years)	100-year GWP (average)
Carbon Dioxide	50-200	1
Methane	12	25
Nitrous Oxide	120	298
HFCs	1.5-264	12-14,800
Sulfur Hexafluoride	3,200	22,800

Source: U.S. Environmental Protection Agency (USEPA) 40 [CFR] Part 98, Subpart A, Table A-1, effective January 1, 2015. .
Acronyms: GWP = global warming potential; HFC = hydrofluorocarbon.

The context given by emission inventories and projections is relevant to a discussion of the treatment of GHG emissions in this document. According to the Emission Database for Global Atmospheric Research (European Commission Joint Research Center 2016), the estimated global emissions in 2012 were 53,937 million metric tons of CO_2e ($MMTCO_2e$), and the U.S. Environmental Protection Agency (USEPA 2014) estimates United States emissions were approximately 6,525 $MMTCO_2e$. In California, the

[46] For additional information on the Fifth Assessment Report, see https://www.ipcc.ch/report/ar5/.

California Air Resources Board (CARB) is the primary agency responsible for providing information on implementing the GHG reductions required by the State pursuant to Assembly Bill (AB) 32 (CARB 2014), the Global Warming Solutions Act of 2006, and its 2016 update, Senate Bill (SB) 32. Together, these laws require CARB to develop regulations that reduce GHG emissions to 1990 levels by 2020 and to 40 percent below 1990 levels by 2030. CARB developed and approved its first Scoping Plan, describing its approach to meeting the AB 32 goal, in 2008. After enactment of SB 32, CARB completed the 2017 Climate Change Scoping Plan (CARB 2017a) to provide the strategy for achieving California's 2030 GHG emissions target. In addition to the Scoping Plan, CARB maintains an online inventory of GHG emissions in California. The most recent inventory, released in June 2017, includes emissions from 2000 to 2015 (CARB 2017b). This inventory is an important companion to the Scoping Plan because it documents the historical emission trends and progress toward meeting the 2020 and 2030 targets, which are 431 $MMTCO_2e$ and 260 $MMTCO_2e$, respectively.

The Scoping Plan includes a modeled reference scenario, or "business as usual" (BAU) projection to monitor the State's emission reduction progress, which estimates future emissions based on current emissions, expected regulatory implementation, and other technological, social, economic, and behavioral patterns. Prior BAU emissions estimates assisted CARB in demonstrating progress toward meeting the 2020 goal of 431 MMTCO2e. California is on track to exceed its 2020 climate target, and the 2017 Climate Change Scoping Plan recommends a number of additional actions to meet the 2030 target (CARB 2017a). These actions include:

- 50 percent Renewable Portfolio Standard
- Doubling building efficiency
- More clean, renewable fuels
- Cleaner zero or near-zero emissions cars, trucks, and buses
- Walkable/bikeable communities with transit
- Cleaner freight and goods movement
- Reduce super-pollutants from dairies, landfills, and refrigerants
- Continue Cap and Trade program for transportation, industry, natural gas and electricity
- Invest in communities to reduce emissions[47]

[47] CARB (2017a) recommends that local governments aim to achieve a community-wide goal to achieve emissions of no more than 6 $MTCO_2e$ per capita by 2030, and no more than 2 $MTCO_2e$ per capita by 2050. These goals are appropriate for the plan level (e.g., city, county, subregional, or regional), but not for specific individual projects because they include all emissions sectors in California.

4.8.1.2 National

The primary source of GHG in the U.S. is energy-use related activities, which include fuel combustion and energy production, transmission, storage, and distribution. Energy related activities generated 84 percent of the total U.S. emissions in 2012. Fossil fuel combustion represents the vast majority of the energy-related GHG emissions, with CO_2 being the primary GHG. The U.S., which has about 4.4 percent of the global population, emits roughly 12 percent of all global GHG emissions.

4.8.1.3 State

California, which has approximately 0.51 percent of the global population, emits less than 0.85 percent of the total global GHG emissions, which is approximately 40 percent lower per capita than the overall U.S. average. Despite growing population and gross domestic product (GDP), gross GHG emissions continue to decrease, as do emissions per capita (per capita emissions have dropped from 14 tons in 2001 to 11.3 tons in 2015, a 19% decrease), exhibiting a major decline in the "carbon intensity" of the State's overall economy. The transportation sector remains responsible for the largest share of GHG emissions in the 2015 Emissions Inventory, accounting for approximately 37 percent of the total. While transportation and electric power sector emissions have long-term emission reduction trends, other sectors have been flat or rising slightly (CARB 2017b). Since its 2004 peak, California has reduced its total annual emissions by 10 percent.

Even though California is aggressively moving to reduce its annual GHG emissions, it is already experiencing the effects of GHG-related climate change, which is a relevant aspect of the environmental setting. A 2013 report entitled *Indicators of Climate Change in California* (Office of Environmental Health Hazard Assessment [OEHHA] 2013) concludes that the changes occurring in California are largely consistent with those observed globally. These climate change indicators show the following:

- Increasing daily annual average temperatures in the State
- More frequent extreme events, including wildfires and heat waves
- Declining runoff volumes due to a diminished snowpack
- Declining number of "winter chill hours" crucial for high-value fruit and nut crops
- Movement of flora and fauna at higher elevations and different times and locations

4.8.1.4 Local

GHG emissions for the Proposed Project include direct and indirect emissions. Direct emissions include GHG emissions generated from construction equipment and vehicles. The Proposed Project is limited to decommissioning, since after completion of decommissioning the property restoration would be controlled by the Department of the Navy (DoN), and the DoN has not yet made any decisions regarding how the SONGS site would be used after decommissioning. As a result, there is no operation period or operating emissions associated with the Proposed Project.

Indirect GHG emissions sources can take many forms. Some of these forms include increase or decrease in electricity or water use, loss of natural CO_2 uptake from developing formerly vegetated areas, material recycling, etc. For the Proposed Project, the indirect GHG emissions would be minor, as there is little or no net electricity use for the Proposed Project, and water use would primarily be the temporary use of water for fugitive dust control during decommissioning activities.

4.8.2 Regulatory Setting

Appendix A summarizes relevant federal and state laws, regulations, and policies related to GHG emissions. Local requirements are discussed below.

4.8.2.1 County of San Diego

The County of San Diego (2011) General Plan includes GHG-related goals and policies. Climate change goals in the General Plan include the use of sustainable technology and products and encouraging contractors to use low-emission construction vehicles and equipment. The County also approved a revised Climate Action Plan (CAP) and revised CEQA guideline documents as attachments to the CAP in February 2018 (County of San Diego 2018). Specifically, this guidance notes the following:

> *A proposed project would have a less than significant cumulatively considerable contribution to climate change impacts if it is found to be consistent with the County's Climate Action Plan; and, would normally have a cumulatively considerable contribution to climate change impacts if it is found to be inconsistent with the County's Climate Action Plan.*

The County has also prepared a CAP Consistency Review Checklist for use in determining consistency with the CAP. This consistency checklist and the CAP are focused on long-term operation GHG emissions sources, most specifically the types of emissions sources related to projects that are approved at the county level (residential/commercial).

The new CEQA guidance documents and CAP Consistency Review Checklist provide no CEQA guidance or criteria by which to review construction impacts.[48] The Proposed Project is a decommissioning action that is solely comprised of construction/demolition activities and has no long-term operating emissions. Therefore, the County's CEQA

[48] Please note that the cited reference source provides the CAP and CAP Consistency Checklist as provided to the Board of Supervisors, and not the final approved versions which, among other edits, removes the one CAP measure and CAP Consistency Checklist item that would have applied to construction GHG emissions (Measure T-3.1: Use Alternative Fuels in New Residential and Non-residential Construction Projects). The removed CAP Consistency Checklist item would have required some percentage (25 percent in the version approved by the Planning Board) of the heavy-duty construction equipment to use alternative fuels such as renewable diesel, renewable natural gas, compressed natural gas or electricity.

guidelines do not provide significance thresholds that can be applied to the Proposed Project.

4.8.2.2 San Diego Air Pollution Control District

Many local air pollution control agencies in California have proposed numerical or other GHG significance criteria. The San Diego Air Pollution Control District (SDAPCD), which has local regulatory authority over the air pollutant emissions, has not established a recommended CEQA-significant emissions level and currently has no GHG emissions regulations that are relevant to the Proposed Project.

4.8.3 Significance Criteria

The significance criteria used to evaluate the Proposed Project impacts to GHG are based on Appendix G of the State CEQA Guidelines Part VII (a and b). According to Appendix G of the State CEQA Guidelines, a significant impact would occur if the Proposed Project would:

- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment.
- Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.

Because the SDAPCD does not have published CEQA guidance for GHGs and the recently approved County of San Diego CEQA guidance does not provide guidance for determining significance of construction-related GHG emissions, the most conservative and applicable GHG emissions threshold from the other air quality districts affected by the Proposed Project is selected. The SCAQMD (2015) GHG emissions significance threshold for industrial projects, which is the most conservative emissions significance threshold value (10,000 MT CO_2e per year), has been used to access the lifetime emissions significance for industrial projects (construction, operation, demolition), and is considered appropriate to determine the significance for the Proposed Project.

4.8.4 Environmental Impact Analysis and Mitigation

This section addresses the impacts of the Proposed Project's GHG emissions and conformance with GHG emissions reduction plans, policies, or regulations. The Proposed Project would generate GHG emissions during dismantlement and demolition activities. Most GHG emissions would occur from mobile sources (trucks and cars, rail, and marine vessels) and the off-road heavy-duty equipment used during Proposed Project decontamination and dismantlement (D&D) activities. Table 4.8-3 provides a list of the Proposed Project's potential impacts related to GHG emissions and global climate change, and any mitigation and Applicant-proposed measures (MMs and APMs) recommended to reduce all impacts to a less-than-significant level.

ENVIRONMENTAL IMPACT ANALYSIS

Impacts of the proposed Project and recommended mitigation measures (MMs) are examined in this section.

Impact GHG-1: GHG Emissions from Project Activities.

The Proposed Project's GHG emissions could exceed GHG emission significance criteria **(Less than Significant).**

Impact Discussion

Table 4.8-2 presents the total GHG emissions estimated for the Proposed Project, with the annual amortized emissions compared to the annual GHG emissions significance threshold. The Proposed Project's GHG emissions estimate is based on the currently proposed activities, which are forecast by Southern California Edison (SCE) to occur over a 7-year period (2019 through 2025).

Table 4.8-2. Greenhouse Gas Emissions Estimate

Emissions Source	GHG Emissions (Metric Tons CO_2e)[1]
Proposed Project Total Emissions	~~48,828~~45,168
Total Direct/Indirect Annualized Emissions[2]	~~6,975~~6,453
Annual Significance Threshold	10,000
Exceed Significance Threshold	No

Source: Appendix E.
Acronyms: CO_2e = carbon dioxide equivalent; GHG = greenhouse gas.
Notes:
[1] These emissions include all of the proposed (limited) offshore structure removal and all the proposed on-site work. Both the onshore and offshore work could be substantially more extensive than proposed by SCE. The full removal alternative for the offshore work is evaluated separately in Section 5.0, *Project Alternatives Analysis*. Any additional onshore work would be determined by the DoN, is not part of the Proposed Project, and is currently unknown.
[2] The total GHG emissions are annualized by amortizing the total emissions as an annual average over the total active schedule for the Proposed Project, which is 7 years (2019 through 2025). Use of the 7-year amoritization period is more conservative than the SCAQMD guidance shown in Appendix E-1, Table S.4.

As shown in Table 4.8-2 the Proposed Project's GHG emissions would not exceed the annual emissions significance threshold. Therefore, impacts would be less than significant.

Mitigation Measures

No MMs are recommended for Impact GHG-1.

Impact GHG-2: Compliance with GHG Emission Reduction Plans, Policies, or Regulations.

The Proposed Project could conflict with GHG emissions reduction plans, policies, or regulations **(Less than Significant).**

Impact Discussion

The Proposed Project, which would indirectly benefit from state and federal efficiency regulations that are intended to reduce GHG emissions from vehicles (see Appendix A), would not be directly subject to any GHG emission reduction regulations. However, under San Diego County General Plan Goal *COS-17 – Sustainable Solid Waste Management*, there is a policy (COS-17-2) to require the recycling, reduction, and reuse of construction and demolition debris. The Assembly Bill 32 Scoping Plan also identifies waste diversion and recycling as a policy goal to reduce GHG emissions, and the State has a policy goal that 75 percent of the solid waste generated by source reduced, recycled, or composted by 2020. Shipping non-radioactive demolition debris that would otherwise be recyclable, to an out-of-state landfill for disposal would not conform to these policies. However, Executive Order No. D-62-02 (California Office of Governor 2002) and the related Regional Water Quality Control Board (RWQCB) moratorium on the disposal of decommissioned materials at Class III waste sites and unclassified waste management units (RWQCB 2002) would override these policies in the case of the Proposed Project's decommissioning waste streams (see Section 2.3.8, *Decommissioning Waste Volumes and Disposal Sites*, for information on waste disposal sites).The County of San Diego's CAP includes the waste reduction provisions in the General Plan, but nothing else specific to the Proposed Project's emission sources (County of San Diego 2018). As such, the Proposed Project would conform with the emissions reduction strategies in the County of San Diego CAP.

There are no other federal, state, or local GHG emissions reduction regulations, policies, or plans that would directly apply to the Proposed Project's GHG emissions sources. Therefore, the Proposed Project would not conflict with any applicable plan, policy, or regulation related to reducing GHGs, including those currently in the County of San Diego's General Plan. Therefore, impacts would be less than significant.

Mitigation Measures

No MMs are recommended for Impact GHG-2.

4.8.5 Cumulative Impacts

The impacts of GHGs differ from criteria pollutants (discussed in Section 4.3, *Air Quality*) in that GHG emissions from a specific project do not cause direct adverse localized human health effects. Rather, the direct environmental effect of GHG emissions is the

cumulative effect on climate change that results in an overall increase in global temperatures, which in turn has numerous indirect effects on the environment and humans. These indirect effects of climate change, depending on the region, timeframe, and metrics used to assess impacts, can solely or additively be adverse, benign, or beneficial. Given that the GHG emissions impacts are already analyzed as a global cumulative impact, additional cumulative impacts analysis was not performed.

4.8.6 Future Activities

Although the exact timing and the extent of work required for the Future Activities, particularly the amount of restoration required by DoN, are currently unknown, implementation of Future Activities would create GHG emissions. DoN approval would be required for implementation of further onshore restoration at a later point in time. Offshore activities would include the removal of the solid covers on the Unit 2 discharge conduit, and, if required by the Commission, the removal of remaining discharge conduit diffuser ports, which would result in additional GHG emissions, but at much lower levels than those estimated for the Proposed Project. The California Coastal Commission (CCC) will require a Coastal Development Permit Future Activities. Should the DoN and CCC both determine that substantial work is necessary for completion of the Future Activities, adverse GHG emissions impacts could occur; however, at this time, the significance of these impacts cannot be determined without speculation. If impacts from Future Activities are found to be significant, the implementation of an MM to reduce or offset GHG emissions may be appropriate.

4.8.7 Summary of Proposed Mitigation Measures

Table 4.8-3 provides a summary of the mitigation and Applicant-proposed measures.

Table 4.8-3. GHG Emissions and Climate Change Impact/Mitigation Summary

Impact	MM/APM
GHG-1: GHG Emissions from Project Activities	None recommended
GHG-2: Compliance with GHG Emission Reduction Plans, Policies, or Regulations	None recommended

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4.9 HYDROLOGY AND WATER QUALITY

This section describes existing conditions relative to hydrology and water quality, identifies applicable significance thresholds, assesses the Proposed Project's impacts to hydrology and water quality and their significance, and recommends measures to avoid or substantially reduce any effects found to be potentially significant.

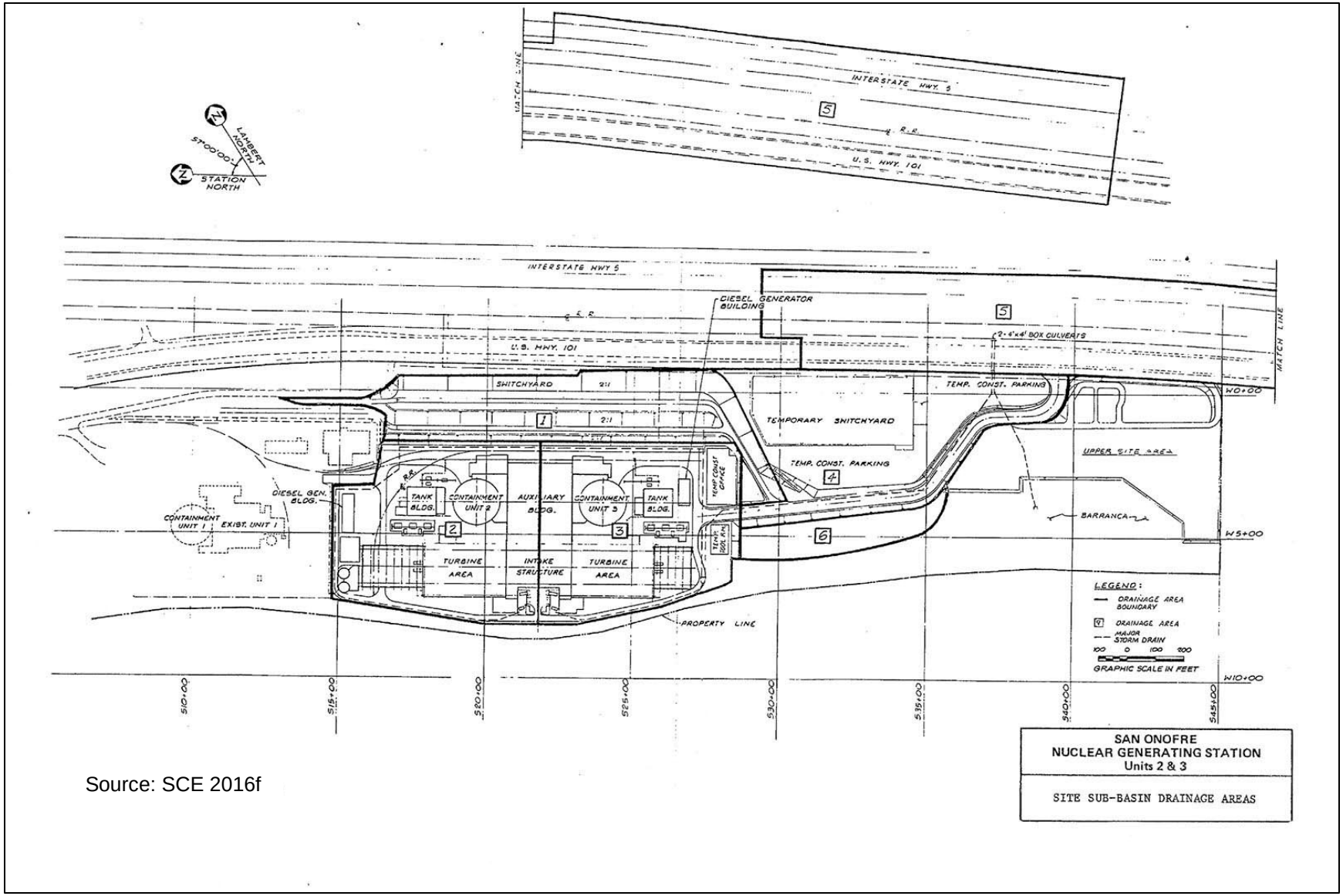
4.9.1 Environmental Setting

4.9.1.1 Onshore Surface Water Drainage and Hydrology

SONGS is within the South Coast Hydrologic Region of California, on a narrow coastal plain in northern San Diego County. The Proposed Project site is bordered by the ocean to the southwest (the project's onshore footprint is 1,200 feet or less from the ocean), undeveloped land to the northwest and southeast, and Old Pacific Highway (Old Highway 101), Burlington Northern Santa Fe Railroad, and Interstate (I-) 5 on the northeast. The SONGS facility is at the base of a bluff that rises sharply 100 to 200 feet from the ocean to a level terrace formation on which the highways and railroad are situated. The terrace extends approximately 1,500 feet inland, at which point the Santa Margarita Mountain foothills begin. These foothills are drained by small ephemeral watercourses that pass mainly under the highway and railroad corridors to the Pacific Ocean. San Onofre Creek, which is in a separate drainage basin from SONGS, drains a 42-square-mile watershed into the Pacific Ocean approximately 1 mile up-coast of SONGS. The Creek generally exhibits flow from November through April, but is dry during the summer (U.S. Geological Survey [USGS] 2017c). Existing offsite and onsite drainage occurs as described below.

- No offsite drainage from the foothills reaches SONGS. The flow is diverted to San Onofre Creek by a diversion structure east of I-5 that has capacity to divert more than the 100-year discharge for the area (more than the probable maximum flood).
- Portions of I-5 and Old Pacific Highway drain to two 4-foot by 4-foot box culverts below the highways (see Figure 4.9-1). Maximum flow from this approximately 33-acre area is 270 cubic feet per second (Southern California Edison [SCE] 2016b). The flow is conveyed in two onsite subsurface drainage pipelines: one pipeline drains to a local canyon in the coastal bluff adjacent to the SONGS South Yard Facilities Area (SYFA); the other is routed under the SONGS south access road and contributes flow to the existing SONGS subsurface drainage system.
- Onsite drainage from the SONGS switchyard, two reactor unit areas, and the make-up demineralizing area (a total area of 33 acres) is collected in a subsurface drainage system that discharges into the Unit 2 discharge conduit (Figure 4.9-1). The system is designed such that if the subsurface system were plugged, surface drainage facilities would transmit all flows over the seawall to the ocean. The NIA, NOCA, and SSA drain through a separate system.

Figure 4.9-1. SONGS Unit 2 Discharge Conduit Drainage Areas



Source: SCE 2016f

- Onsite and offsite stormwater is also collected in a drainage culvert located between the ISFSI and Parking Lot 4.
- Storm drainage from the North Industrial Area (NIA) is collected in a sump and pumped independently to the Unit 2 discharge conduit. The SYFA, and SSA and NOCA (not shown in Figure 4.9-1), drain by sub-surface to the same system.

Flooding

The site is not in a known floodplain (Federal Emergency Management Agency [FEMA] 2012). Since San Onofre Creek is in a separate drainage basin, it presents no flood potential for the SONGS site. Drainage from the onsite portion of the highways described above has a potential to create minor localized flood discharges that the existing SONGS drainage system can handle (see above under *Onshore Surface Water Drainage and Hydrology*). Prior to plugging or sealing the conduits, SCE proposes to eliminate or modify the subsurface drainage system to reroute flow to the beach (see Section 2.3.7, *Offshore Dispositioning Approach*).

Peak discharge rates for this flow, which were calculated using a regional equation developed by the U.S. Geologic Survey and California Department of Water Resources (Waananen and Crippen 1977) and using a watershed area based on Table 2.4-3 *San Onofre Site Sub-Basin Drainage Parameters* in the UFSAR (SCE 2016f), are: Q_2 – 1.5 cubic feet per second (cfs); Q_5 – 4.5 cfs; Q_{10} – 7.8 cfs, Q_{25} – 15.1 cfs; Q_{50} – 22.2 cfs; and Q_{100} – 29.7 cfs, where Q_{nn} refers to the peak discharge rate (nn being the flood year). For instance, a 10-year flood (with a 10 percent chance of occurring in any given year) would have a peak flow rate of 7.8 cfs. These are approximate discharges that depend on the final configuration of the watershed draining to the seawall.

Removal of the subsurface drainage system from service would allow the site to be graded to collect rainfall and convey surface flows towards existing openings at the top of seawall. Two main drainage swales (one for each Unit) are in place to direct runoff to the seawall where openings at the top of the seawall (one per Unit) allow surface flow to the ocean (SCE 2016a – DR #1-15) potentially flooding the Beach Access Walkway. Inundation by other environmental phenomena, such as tsunamis, is discussed in Section 4.7, *Geology, Soils, and Coastal Processes*.

Groundwater

Hydrogeologic and groundwater conditions at the SONGS site have been characterized by geotechnical boring and monitoring well data. The SONGS site is on the southern boundary of the San Onofre Valley Groundwater Basin (California Department of Water Resources [CDWR] 2004). San Onofre Valley and the narrow groundwater basin extend inland from the coast about 13 miles. Alluvial deposits in the valley form the principal aquifer, which ranges in thickness from 25 to 55 feet (CDWR 2004). Several supply wells

operated by Marine Corps Base Camp Pendleton (MCBCP) are located up gradient along San Onofre Creek about 1 mile north of the Proposed Project site. Water derived from the basin is for municipal and military use (ENERCON 2014). The City of San Clemente has two groundwater supply wells located 3.2 and 3.4 miles north of SONGS.

Groundwater levels measured near the seawall are 25.5 to 26.5 feet below ground surface (BGS) and 8 to 10 feet BGS in the NIA, corresponding to a groundwater elevation of approximately +5 feet mean lower low water (MLLW) (Parsons 2010). Groundwater flow direction beneath SONGS is toward the northwest at a very low gradient (0.2 to 1.0 percent) (SCE 2016b); tidal influences on groundwater were detected in monitoring wells near the seawall (1 to 3.4 feet) and along the seaward edge of the NIA (0.02 to 0.2 feet) (Parsons 2010). Groundwater at the Proposed Project site occurs within the San Mateo Formation comprised of medium to coarse grained sandstone with a high hydraulic conductivity of 19 to 115 feet per day (Parsons 2010; SCE 2016b). No water is derived from aquifers below the site for operations or potable supplies (ENERCON 2014).

SCE constructed 15 monitoring wells in the NIA from 2009 to 2012 to monitor groundwater beneath the NIA and the former Unit 1 for the presence of tritium (SCE 2015a). This work allowed characterization of the local hydrogeology and groundwater gradient and flow direction, and determine the possible source and lateral extent and level of tritium. In addition, groundwater extraction (pumping) was performed to determine the effect on the tritium concentration in the plume. Groundwater extraction began in December 2012 and the tritium levels at the extraction wells remained below the lower levels of detection (LLD) (3,000 picocuries per liter [pCi/L]) throughout 2014 to mid-2015 (SCE 2015a). Tritium levels in the other NIA monitoring wells ranged from 300 to 2,000 pCi/L (less than [<] LLD) before and during the extraction period. The extraction wells were turned off in April 2015 with monthly groundwater sampling and testing from May through August 2015 in seven monitoring wells (SCE 2015a). According to SCE (2015b), tritium levels in the NIA were consistent with the levels measured before cessation of groundwater pumping and all levels were below the LLD. Based on these results, groundwater extractions in the NIA did not resume, but quarterly groundwater monitoring continued (SCE 2015b).

4.9.1.2 Offshore Hydrology

The offshore portion of the Proposed Project includes tide and submerged lands in the Pacific Ocean, southwest of SONGS, where the offshore conduits, and navigational and environmental monitoring buoys are located. Prior to the cessation of SONGS operations, the Pacific Ocean was the source of seawater used for “once-through cooling” at SONGS Units 2 and 3 to remove waste heat generated during the thermal cycle. Seawater was supplied through unit-specific intake conduits to the cooling water systems and returned to the ocean through the unit-specific discharge conduits. Following the shutdown of the power plant and the installation of the Spent Fuel Pool Island cooling system, the power plant and spent fuel pools are no longer cooled with ocean water (SCE 2016c). When this

occurred, the SONGS post-shutdown operational demand for cooling and makeup water from the ocean was reduced from 2,256 to 37 million gallons per day between 2011 and 2016 (U.S. Environmental Protection Agency [USEPA] flow data, cited in Statewide Advisory Committee on Cooling Water Intake Structures 2017) and it was expected to continue to be reduced until such demands were eliminated (SCE 2014a). In February 2018, the USEPA reported that the operational demand for cooling and makeup water from the ocean was reduced from 37 million gallons per day (MGD) to 0 gallons per day between 2016 and 2017 (Statewide Advisory Committee on Cooling Water Intake Structures [SACCWIS] 2018). Consequently, there would be no adverse impacts to water quality associated with cooling and makeup water used for operations.

Although once-through cooling at SONGS is no longer required, a significantly reduced intake of water is still used for waste dilution per the SONGS's National Pollutant Discharge Elimination System (NPDES) permit. In January 2018, the average Unit 2 intake was 9.91 MGD and the average for Unit 3 was 11.43 MGD (SCE-AM 2018d). The Unit 2 discharge conduit is used to discharge treated sanitary wastewater, sewage treatment plant effluent, and stormwater runoff, which per the NPDES permit requires dilution at a 10:1 ratio (SCE 2017c). The Unit 3 discharge conduit is not in service (SCE 2016a – DR #1-16). Existing discharge volumes through the Unit 2 conduit are approximately 21.37 MGD (SCE-AM 2018d), which is approximately 30 MGD less than authorized under SCE's existing NPDES permit. Discharges through Unit 2 would continue during the Proposed Project (SCE 2017c). New discharges would include treated water from the spent fuel pools, and water used for reactor vessel segmentation (see Section 2.2.3.8, *Water Processing*). If D&D work near the onshore intake structure requires dewatering of structures, dewatered effluent would also be treated and discharged (see Section 2.4.1, *Additional Onshore Substructure Removal*).

4.9.1.3 Water Quality

Water quality is affected by many factors including oceanographic and atmospheric processes (e.g., currents, waves, winds), climatic conditions (including episodic events such as El Niño), atmospheric fallout, land point and nonpoint sources, and vessel discharges. The San Diego Regional Water Quality Control Board (RWQCB) enforces water quality objectives and implements plans to protect the health of water within the Proposed Project area. The Water Quality Control Plan (Basin Plan) for the San Diego Region is designed to preserve and enhance water quality and to protect beneficial uses of regional surface waters, groundwater, and coastal bays and estuaries (RWQCB 2016). Table 4.9-1 summarizes Basin Plan-designated beneficial uses for the two coastal waters nearest to SONGS. Under the Water Quality Control Plan for the Ocean Waters of California (Ocean Plan), the State Water Resources Control Board (SWRCB) (2015) also maintains and prohibits discharges in, and monitors, 34 marine Areas of Special Biological Significance (ASBS) for water quality; however, there are no ASBS inside or

connecting to SONGS, and the nearest is Heisler Park, approximately 17 miles to the northwest.

Table 4.9-1. Beneficial Uses for Waters Near SONGS

Basin Plan Waterbody	Pacific Ocean	San Onofre Creek Mouth
Navigation (NAV)	Existing	
Industrial Service Supply (IND)	Existing	
Recreational Use for Water Contact (REC1)	Existing	Existing
Non-Contact Water Recreation (REC2)	Existing	Existing
Commercial and Sport Fishing (COMM)	Existing	
Biological Habitats of Special Significance (BIOL)	Existing	
Marine (MAR)	Existing	Existing
Wildlife Habitat (WILD)	Existing	Existing
Rare, Threatened, or Endangered Species (RARE)	Existing	Existing
Aquaculture (AQUA)	Existing	
Migration of Aquatic Organisms (MIGR)	Existing	Existing
Spawning, Reproduction, or Early Development (SPWN)	Existing	Existing
Shellfish Harvesting (SHELL)	Existing	

Source: RWQCB 2016.

In the Proposed Project area, water quality also reflects natural seasonal patterns. During late spring through fall, solar heating preferentially warms the ocean surface, resulting in depth-related gradients in water temperature (i.e., thermocline). Strong density gradients (i.e., pycnocline), related primarily to the water temperature changes with depth, restrict vertical mixing of the water column. In winter and early spring, the strength of the vertical stratification decreases in response to weaker solar heating, mixing by winter storms, and upwelling. Seasonal upwelling and downwelling also have an effect. Upwelling is initiated when northern winds displace surface waters offshore, resulting in replacement by colder, deeper waters with lower concentrations of dissolved oxygen and higher salinity and nutrient concentrations. In the SONGS area, upwelling is generally present during spring. Downwelling occurs when southern winds push offshore waters toward the shore, thus pushing nearshore surface waters down and causing warmer waters and lower salinity than are typical for deeper waters (EDAW 2005).

Additionally, river and stream discharges and stormwater runoff add freshwater (which can reduce near-surface salinity miles from shore) suspended sediments, nutrients, bacteria and other pathogens, and chemical contaminants to nearshore waters. Publicly-owned treatment plants discharge treated sewage effluent to the ocean through subsurface outfalls, introducing a low-salinity plume containing suspended solids and pollutants to the marine environment. MCBCP operates seven sewage treatment plants with varying capacities and disposal means, some of which include ocean discharge. The nearest municipal wastewater outfall to the SONGS site is in the City of San Clemente. Water quality testing for, and monitoring of, radiological contaminants are discussed in Section 4.1.1.7 *Radiological Monitoring.*

Offshore Sediments

Sediment quality typically varies in relation to grain size and proximity to input sources. Within the Proposed Project area, sediment texture varies from primarily sandy materials in shallow nearshore waters to finer-grained materials in deeper waters farther from shore. Relict sand deposits also occur offshore, particularly in locations of historical river outflows (MBC 2016a). Trace metal and organic contaminants in coastal waters typically adsorb onto suspended particulates or settle and adsorb onto sediment particles on the seafloor. Because of their high surface-to-volume ratio, finer sediments (silts and clays) generally have higher contaminant concentrations than coarser sediments (sands). Once incorporated into bottom sediments, contaminants may be remobilized by currents or storms, bioturbation, or mechanical disturbance such as dredging.

Offshore sediments were sampled at 18 stations along the SONGS Units 2 and 3 offshore conduit corridors in May and June 2016, and characterized for their concentrations of chemicals and other water quality parameters (MBC 2016a). Four replicate diver-operated box cores, each containing approximately 0.39 inch squared of sediment from the seafloor, were collected at each station. Assayed concentrations included total solids, metals, organochlorine pesticides, polychlorinated biphenyls (PCBs), and polycyclic aromatic hydrocarbons (PAHs). The results of the sediment chemical assay indicated that the concentrations of the assayed parameters were low, sometimes below detection limits, and generally below reporting limits: non-metal contaminants ranged from absent to uncommon; PCBs and PAHs levels were undetected or otherwise low (i.e., between reporting limit and laboratory method detection limit); organochlorine pesticides and mercury were undetected; and the shallowest surveyed areas had the highest concentrations and greatest variety of metals, with the metal concentrations and varieties decreasing with increasing distance from the shore.

Water Quality Characteristics

Temperature

Along the San Onofre coast, nearshore surface waters range from 52 degrees Fahrenheit (°F) in winter to 68°F in summer (EDAW 2005). Nearshore temperatures are more uniform through the water column due to turbulent mixing and shallower depths (SCE 2016f). Table 4.9-

Table 4.9-2. Average Nearshore Surface Water Temperature, San Clemente

Month	Temperature (°F)
January	57
February	57
March	58
April	58-59
May	60-61
June	63
July	64-66
August	68-67
September	66
October	65-63
November	61
December	58

Source: National Oceanographic Data Center 2016.

2 shows average nearshore water temperatures recorded north of SONGS (National Oceanic and Atmospheric Administration [NOAA] 2016).

Salinity

Ocean salinity along the California coast averages approximately 33 parts per thousand (ppt), with localized temporary variations due to runoff and precipitation. Reported salinities around SONGS have ranged between 33.2 and 33.7 ppt (EDAW 2005). Salinity levels throughout the water column typically differ by less than 1 ppt from surface to bottom waters, except during winter storms when freshwater runoff reduces surface water salinity, especially at nearshore locations. Salinity levels in both surface and bottom waters may be slightly higher from April to August due to upwelling.

Dissolved Oxygen

Dissolved Oxygen (DO), nearshore of San Onofre, typically ranges from 8 to 9 milligrams per liter (mg/L) (EDAW 2005; SCE 2017f), with the range resulting from a combination of factors, including intrusions of water masses, primary production (phytoplankton blooms), and upwelling or downwelling. Nearshore waters generally have higher DO concentrations than offshore areas due to shallow water depths and continuous wave action that promotes mixing.

Acidity

Seawater potential of hydrogen (pH) in the coastal San Onofre marine environment normally ranges between 7.5 and 8.5 ppt, being slightly alkaline (EDAW 2005). Historical pH values have ranged from 7.6 to 8.2 ppt in the Southern California Bight (Southern California Coastal Water Research Program [SCCWRP] 2007). Slightly higher pH values occur during May through September when water temperatures are warmer, and in surface waters as related to equilibrium with carbon dioxide in the atmosphere. Depth related changes in pH typically are minimal.

Water Clarity

Light penetration in seawater is the limiting factor associated with photosynthetic growth of phytoplankton, kelp, and other marine plants. Waters tend to be more turbid in the winter due to greater wave energy, surface runoff, and river discharges. Runoff related discharges and associated natural turbidity occur in pulses rather than as continual discharges. Other seasonal reductions in water clarity may occur in spring and summer due to plankton and suspended particles concentrating near the thermocline. Phytoplankton blooms (e.g., red tides) may reduce light transmittance (transmissivity) levels in summer months (U.S. Army Corps of Engineers [USACE] 2015).

Water clarity is measured using several methods, including percent light transmittance (transmissivity), total suspended solids (TSS) concentration, and the nephelometric method, which measures and compares light scattered by a water sample and light scattered by a reference solution. In general, light transmittance increases and suspended solid concentrations decrease with distance from shore. Similar to transmissivity values, TSS or particulate concentrations are generally higher nearshore than offshore, likely due to storm runoff or algal blooms, which primarily affect the nearshore area (USACE 2015). TSS concentrations ranged from less than 1 to 47 mg/L offshore Carlsbad over a 13-year monitoring period, with the highest concentrations recorded after storm events or occasionally in the summer, probably due to phytoplankton blooms (USACE 2015). Nearshore turbidity measurements ranging from less than 1 to 11 nephelometric turbidity units represent typical background values near SONGS in the Encinitas-Solana Beach vicinity (USACE 2015). Elevated values of 50 to 187 nephelometric turbidity units have been reported at control locations during beach replenishment monitoring at Carlsbad and Oceanside (USACE 2015).

Nutrients

Nutrient concentrations for nearshore waters typically are higher near the bottom than near the surface, except during upwelling periods. Nearshore nutrient concentrations may be elevated in areas of wastewater discharge and near the outlet of rivers, lagoons, bays, and harbors. Nitrate levels in nearshore surface waters may vary from 0.3 to 12 micrograms per liter (µg/L), and phosphate levels may range from 9.5 to 47.5 µg/L, with higher values associated with upwelling or anthropogenic discharges (EDAW 2005).

Discharges

Clean Water Act (CWA) section 303(d) requires states to list waters that do not meet water quality standards and to develop a Total Maximum Daily Loads (TMDL) when a waterbody is identified as impaired (the listing of all impaired waterbodies is called the 303(d) List). Within the San Juan Creek Watershed where SONGS is located (ProjectCleanWater.org 2016), the nearest 303(d) listed waterbodies are San Mateo Creek and the Pacific Coast shoreline near the mouth of San Mateo Creek (see Table 4.9-3). These waterbodies are listed under the 2014 and 2016 California Integrated Report: CWA Sections 303(d) and 305(b) as having impaired for elevated indicator bacteria levels and invasive species (SWRCB 2017); however, no TMDLs have been prepared for these 303(d) listings, and the sources of the pollutants are unknown.

Table 4.9-3. 303(d) Listings Near SONGS

Location	303(d) Constituent
Pacific Ocean Shoreline San Mateo Creek Outlet	Indicator Bacteria (Total Coliform)
San Mateo Creek	Indicator Bacteria (E. coli, Enterococcus, Total Coliform), Invasive Species

Source: SWRCB 2017.

Discharges are classified as either point source or nonpoint source. Point source discharges originate from known sources and generally flow through pipes or channels. Typically, point sources are individually regulated by federal and state agencies. Nonpoint source discharges are a combination of discharges from a general geographic region rather than from a single identifiable source. One of the largest discharges of pollution in the Southern California coastal zone is runoff from the Tijuana River Watershed: in February 2017, at least 143 million gallons of untreated wastewater was discharged into the Tijuana River, resulting in multiple beach closures in the City of Imperial Beach, San Diego County (International Boundary and Water Commission 2017). The Tijuana River Watershed is an approximately 1,750-square-mile watershed on both sides of the international border between California and Mexico. Nearly three-quarters of the watershed is in Mexico, but it drains to the Pacific Ocean through the 8-square-mile Tijuana River Valley, which is north of the border (Tijuana River Valley Recovery Team 2012).

In the California South Coast region, composed of Orange, Los Angeles, and San Diego Counties, 12 wastewater treatment plants each discharge more than 1 MGD into the Pacific Ocean. In total, these 12 plants discharge approximately 834 MGD, or approximately 3.05 billion gallons per year of treated wastewater (Rodman et al. 2018). Other point source discharges in the California South Coast Region include smaller (less than 1 MGD) municipal wastewater plants, electrical generating stations, and petroleum refineries. Although the volume of effluents discharged through marine outfalls has increased in the last few decades, emissions of solids have declined substantially as a result of source control and improved treatment methods.

Wastewater outfall monitoring is conducted in the surf zone and nearshore area to assess bacteriological (total coliform, fecal coliform, and enterococcus) conditions in waters used for body contact, as well as offshore monitoring for general physical and chemical parameters. The nearest city that collects beach bacteriological samples is San Clemente, north of the Proposed Project area. If water quality bacteriological standards are exceeded, the City must post notices on City beaches to alert the public of the exceedances. Table 4.9-4 summarizes City beach postings for 2000 through 2015 (County of Orange 2016).

Table 4.9-4. City of San Clemente Beach Postings

Year	# Postings	Days	Beach Mile Days	Year	# Postings	Days	Beach Mile Days
2000	5	13	3.9	2008	6	10	1.1
2001	4	13	3.8	2009	8	20	1.1
2002	6	10	0.6	2010	1	2	0.1
2003	4	7	0.6	2011	7	17	1.1
2004	2	5	0.3	2012	5	42	2.4
2005	2	4	0.2	2013	2	4	0.2
2006	4	6	0.3	2014	0	0	0.0
2007	3	6	0.3	2015	8	214	1.7

Source: County of Orange 2016.
Note: "Year" is for the monitoring months of April through October.

Petroleum Hydrocarbons

Petroleum hydrocarbons are organic contaminants that enter the ocean both as the result of human error (e.g., oil spills) and naturally. In addition to natural oil seeps, principal sources of petroleum hydrocarbons in the Southern California Bight include: urban runoff containing oils, gasoline, diesel fuel, and tire particles; produced-water discharges; atmospheric deposition from the combustion of fossil fuels; vessel leaks, spills, and exhaust; leaching of creosote from wooden pilings; and oil and grease contained in municipal sewage effluent.

Trace Metals

Ambient trace metal concentrations in the water column typically occur at levels below standard analytical method detection limits. To measure such contaminants in seawater, resident California mussels (*Mytilus californianus*) and finfish are used as indicator organisms to indirectly monitor water quality, as they accumulate contaminants directly from seawater and ingested food. Trace copper concentrations at the nearest sampling location to SONGS, which is at Dana Point, is generally not high for shellfish (Gregorio and Jin 2011). However, trace metal (i.e., arsenic, cadmium, lead, mercury, selenium) concentrations in finfish exceed the 95th percentile of nationwide samples (Institute of Medicine 1991). A more-recent study (2003) of marine sediment contamination in the Southern California Bight, which includes the Project area, found that, with the exception of mercury and silver, trace metal contamination of marine sediments in the inner to outer shelf at a 5- to 200-meter [16- to 656-foot] water depth, did not exceed a level deemed likely to produce adverse biological effects (Maruya and Schiff 2009). Mercury and silver exceeded this level on the outer shelf only (120 to 200 meters depth) and within only 3.7 percent of the total outer shelf (Maruya and Schiff 2009).

4.9.2 Regulatory Setting

The primary federal and state laws, regulations, and policies that pertain to the Proposed Project are summarized in Appendix A. At the local and regional levels, the California Coastal Sediment Management Workgroup has teamed with local governments to develop local Coastal Regional Sediment Management Plans (CRSMPs). The San Diego CRSMP (Moffatt & Nichol et al. 2009) covers only the coast from Oceanside to the Mexican border and is not applicable to the Proposed Project. The Orange County CRSMP (Everest International Consultants, Inc. 2013) includes all of Orange County down to the county line at San Mateo Creek, which is 2 miles north-northwest of the Proposed Project area. While no projects within the Orange County CRSMP apply directly to the Proposed Project area, some of those efforts may result in changes to the shoreline through longshore transport of littoral sediment from Orange County.

4.9.3 Significance Criteria

The significance criteria used to evaluate the Project impacts to hydrology and water quality are based on Appendix G of the State CEQA Guidelines. According to Appendix G of the State CEQA Guidelines, a significant impact would occur if the Project would:

- Violate any water quality standards or waste discharge requirements, create substantial additional sources of polluted runoff, or require significant additional treatment of dewatered subsurface structures, systems, and components (SSCs)
- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in:
    - substantial erosion or siltation on- or off-site, or
    - flooding on- or off-site (e.g., by substantially increasing the rate or amount of surface runoff or by exceeding the capacity of existing or planned stormwater drainage systems)
- Otherwise substantially degrade the quality of marine waters and sediments, for example, if activities conducted offshore or onshore would result in increased turbidity; biological/chemical/dissolved oxygen demand; significant spills or other releases of oil, chemicals, and other toxic materials; or the deposition of marine debris from the removal of offshore conduit components.

4.9.4 Environmental Impact Analysis and Mitigation

The Proposed Project may affect hydrology and water quality during onshore and offshore decontamination and dismantlement (D&D) construction activities. Such activities would potentially discharge chemicals or physical materials to surface or marine waters and sediment, or re-suspend physical or chemical materials from marine sediment within the offshore area. The Proposed Project has incorporated design measures and other best management practices (BMPs) to reduce potential direct and indirect Project-related impacts. Table 4.9-5 at the end of this section provides a summary of the Proposed Project's potential impacts related to hydrology and water quality, and any mitigation or Applicant-proposed measures (APMs) recommended to reduce impacts to a level that is less than significant.

ENVIRONMENTAL IMPACT ANALYSIS

Impacts of the proposed Project and recommended mitigation measures (MMs) are examined in this section.

Impact WQ-1: Violation of Water Quality Standards or Waste Discharge Requirements, or Generation of Substantial Additional Sources of Polluted Runoff.

Ground disturbances and building dismantlement could result in contamination of surface water or groundwater **(Less than Significant).**

Impact Discussion

Onshore decommissioning activities would involve substantial use of heavy equipment. Accidental spills or discharge of materials such as paint flakes, diesel fuel, gasoline, lubrication oil, cement slurry, hydraulic fluid, anti-freeze, transmission fluid, lubricating grease, and other fluids used during construction could pollute local surface waters or groundwater. As stated in the Project Description (Section 2.2.3.6, *Spill Prevention and Response and Groundwater Protection*), a designated area would be set up to refuel equipment and engineering and administrative controls would be implemented to reduce potential leaks during refueling activities. Chemicals and other materials, including radioactive materials, now in the facilities could be accidentally discharged into local surface waters and adversely affect beneficial uses (see Section 4.9.1.3, *Water Quality*, above). For example, dewatering would be necessary for removal of some below-ground structures, with the potential for contaminated dewatering water being discharged into the Pacific Ocean or minor local drainage. In addition, prior to decommissioning, sanitary sewer lines would be flushed with clean water to the main sewer line and then isolated, which would prevent the possibility of accidental releases of waste that could degrade surface runoff and discharge into the ocean.

Dewatering would be performed under SWRCB guidelines intended to avoid impacts to water quality. As stated in Section 2.2.3.8, *Water Processing*, all water from the radiological buildings would be processed, likely using skid-mounted, temporary water processing systems. Once processed and sampled, the processed water would be discharged through the SONGS Units 2 discharge conduit in accordance with the SONGS NPDES permit and the SONGS Offsite Dose Calculation Manual. Additional dewatering would also likely be necessary for removal of subsurface foundations, where the effluent would be discharged in compliance with regulatory requirements. The Applicant proposes control measures and procedures for decommissioning activities as described in Table 4-2 and Sections 2.2 and 2.3, intended to prevent contamination of surface waters and groundwater. These measures would prevent, contain, and mitigate accidental spills during demolition; and address treatment and disposal of any dewatered groundwater to prevent violation of water quality objectives or damaging beneficial uses.

The Applicant also proposes adherence to guidance from the Nuclear Energy Institute Ground Water Protection Initiative (Appendix A), which is applicable to plants being decommissioned. The Applicant would continue to monitor groundwater on a regular basis in accordance with the groundwater protection program. A Waste Management Program would also be developed consistent with regulatory requirements. Hazardous (radiological and non-radiological) and non-hazardous waste would be characterized per the Program and each waste type would be removed, packaged, or disposed of in accordance with applicable regulations. The Waste Management Program would also address the risk reduction and management of potential onshore discharges that may degrade water quality due to surface runoff and discharge to the ocean.

In addition, SONGS operates under a Spill Prevention Control and Countermeasure (SPCC) Plan, an associated Spill Contingency Plan, and Hazardous Materials Business Plan to ensure contamination of onshore waters is prevented. These plans are required by the U.S. Environmental Protection Agency (EPA) under 40 CFR Part 112 and would be updated as necessary during the Proposed Project to account for system removals or use of petroleum/fuel tanks to support decommissioning activities. Contamination of local surface waters during demolition would also be reduced to a less-than-significant level by adherence to the Stormwater Pollution Prevention Plan (SWPPP) required by the ~~San Diego RWQCB~~ SWRCB under Section 402 of the CWA (See Appendix A).

Potential releases would be minimal, would likely be captured and contained, and therefore, are not likely to exceed water quality thresholds or have the potential to impact water quality. Additionally, any decommissioning activities and associated risks to water quality are temporary and would be addressed by the implementation of regulatory requirements.

In its APMs (see Table 4-2, *Applicant-Proposed Measures*), SCE commits to preparing the following plans to ensure that water quality standards and waste discharge

requirements are adhered to, and there is no generation of substantial additional sources of polluted runoff.

APM-1. Waste Management Program (Section 4.1, *Hazardous and Radiological Materials*).

APM-2: Hazardous Materials Business Plan (Section 4.1, *Hazardous and Radiological Materials*).

APM-12: Stormwater Pollution Prevention Plan (SWPPP). The Applicant ~~and/~~or its contractor shall obtain coverage for the Proposed Project under the Construction General Permit (Order No. 2009-009-DWQ, as amended by 2010-0014-DWQ and 2012-006-DWQ). Per the requirements of the California State Water Resources Control Board (SWRCB), the Applicant ~~and/~~or its contractor shall prepare a SWPPP to reduce the potential for water pollution and sedimentation from Proposed Project activities. The SWPPP will be project specific and expressly address site runoff, assuring that project runoff would not affect or alter drainage patterns to sensitive habitat, including but not limited to vernal pool habitat. The SWPPP shall set forth a best management practices including, but not limited to the following:

- Silt fences, fiber rolls, and other measures shall be placed where they are determined to be appropriate for erosion and sediment control.
- A monitoring, maintenance, and reporting schedule shall be prepared and implemented and shall identify the responsible entities.

The Applicant ~~and/~~or its contractor shall notify California State Lands Commission staff that the SWPPP has been certified and is available in the SWRCB's Stormwater Multiple Applications and Reports Tracking System not less than ~~60~~30 days prior to commencement of ground disturbing activities.

APM-13: Spill Prevention Control and Countermeasure (SPCC) Plan. The Applicant ~~and/~~or its contractor shall continue compliance with the requirements of the U.S. Environmental Protection Agency (U.S. EPA; 40 CFR Part 112) through continued use of the existing SONGS SPCC Plan, including amendments as required. The SPCC is certified by a licensed professional engineer and then provided to the U.S. EPA's Regional Administrator (San Diego County Department of Environmental Health, Hazardous Materials Division). The SPCC Plan shall continue to include, but is not and shall not be limited to the following:

- A facility description.
- A complete list of all oil storage containers (aboveground containers and completely buried tanks) with a capacity of 55 U.S. gallons or more.
- A description of tanks and containers with the potential for an oil discharge; mode of failure, flow direction and potential quantity of the discharge; and the secondary containment method and containment capacity provided.
- A description of the inspection or testing program for all aboveground bulk storage containers including record-keeping of these inspections or tests.

- A requirement for training of oil-handling personnel in the operation and maintenance of equipment to prevent discharges; discharge procedure protocols; applicable pollution control laws, rules and regulations; general facility operations; and the contents of the SPCC Plan.
- A requirement for annual discharge prevention briefings conducted for all oil-handling personnel. Briefings would highlight and describe past reportable discharges or failures, malfunctioning components, and any recently developed precautionary measures.
- Implementation of security measures to prevent unauthorized access to oil handling and/or storage area(s).
- A description of immediate actions to be taken by facility personnel in the event of a discharge to navigable waters or adjoining shorelines.

The Applicant or its contractor shall submit the initial certified Plan to California State Lands Commission (CSLC) staff for review ~~and approval by CSLC staff~~, in consultation with the U.S. EPA and California Coastal Commission staffs, not less than 30 days prior to commencement of Proposed Project activities. In accordance with regulatory requirements, the Spill Contingency Plan and any subsequent updates will be maintained onsite throughout the Proposed Project for review.

APM-14: Spill Contingency Plan. The Applicant ~~and/~~or its contractor shall maintain compliance with the requirements of the U.S. Environmental Protection Agency (40 CFR Part 112) through implementation of the existing Spill Prevention Control and Countermeasure Plan, including amendments if required, that describes the actions facility personnel shall take in response to hazards to human health or the environment from fires, explosions, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil, or surface water during the Proposed Project. At a minimum, the Spill Contingency Plan shall include:

- A description of all arrangements agreed to by local police departments, local and federal fire departments, hospitals, contractors, and state and local emergency response teams to coordinate emergency services
- Names, addresses, and phone numbers (office and home) of all persons designated to act as primary and alternate emergency coordinators
- A list of all emergency equipment at the facility (such as fire extinguishing systems, spill control equipment, communications and alarm systems (internal and external), and decontamination equipment), as required, as well as the location and a physical description of each item on the list, and a brief outline of its capabilities
- An evacuation plan that includes evacuation procedures and instructions, as well as primary and alternate evacuation route
- Procedures to be followed for notification and reporting of hazardous releases
- The current telephone number of the State Office of Emergency Services

The Applicant or its contractor shall submit the initial Plan to California State Lands Commission (CSLC) staff, for review ~~and approval by CSLC staff~~ in consultation with the Regional Water Quality Control Board and California Coastal Commission staffs, not less than 30 days prior to commencement of Proposed Project activities. In accordance with regulatory requirements, the Spill Contingency Plan and any subsequent updates will be maintained onsite throughout the Proposed Project for review.

The implementation of APM-1, APM-2, APM-12, APM-13, and APM-14, would further reduce potential water quality impacts to a less-than-significant level.

Mitigation Measures

No MMs are recommended for Impact WQ-1.

Impact WQ-2: Groundwater Characterization and Discharge.

Groundwater encountered during onshore decommissioning activities may contain contaminants requiring containment and treatment prior to discharge or disposal **(Less than Significant with Mitigation).**

Impact Discussion

The Proposed Project's onshore decommissioning activities would generally remove structures to at least 3 feet below the existing grade (with some removal to greater depths as needed). Structures located below grade include concrete slabs, underground storage tanks, support stanchions, utility vaults, sumps, vehicle barriers, building foundations, tunnels, and similar items. If removal of deep subsurface structures that extend below the water table at elevation +5 feet MLLW is necessary, dewatering may be required. Discharges of groundwater meeting regulatory requirements would not have an adverse impact on the local surface water or offshore waters. SCE's existing NPDES permit allows for dewatering and discharge of groundwater ~~would either need to acquire new discharge permits or modify the existing NPDES permits for these discharges~~. ~~In addition~~However, the pumped groundwater would require characterization prior to ~~dewatering~~discharge, and likely containment and testing to determine disposal requirements, potentially including treatment, on-site disposal, or off-site disposal.

Mitigation Measure

Implementation of **MM HAZ-6** would be sufficient to reduce potential water quality impacts to a less-than-significant level.

MM HAZ-6: Soil and Groundwater Site Characterization ~~Study~~ and Soil Management Plan (Section 4.1, *Hazardous and Radiological Materials*).

Impact WQ-3: Groundwater Depletion or Reduced Recharge.

Water use during construction and dewatering could adversely affect the availability of groundwater **(Less than Significant).**

Impact Discussion

The Proposed Project would use about 123 acre-feet (77.5 million gallons) of water for dust control, 3 acre-feet (1 million gallons) to fill the reactor cavities in preparation for reactor vessel segmentation, and 72 acre-feet (23.5 million gallons) for use by on-site personnel, for a total of 198 acre-feet (102 million gallons) (SCE 2018a; SCE 2018c). Highest yearly water use would be 42 acre-feet during the first 4 years of demolition activities, when dust control operations would be needed. Dust control water would be recycled water to the maximum extent possible, followed by potable water.

Water sources would be specified by the Decommissioning General Contractor. The most-likely water source would be local water suppliers which obtain water from the State Water Project, the Colorado River, and other groundwater from established suppliers. Because the dust-control water would be recycled or potable, local groundwater is unlikely to be used. The Proposed Project water use would therefore have no effect on local groundwater levels. As noted in Impact WQ-2, dewatering would be necessary for some below-ground structures. However, impacts would be less than significant as the amount of dewatering would be limited, and the local groundwater is not part of any groundwater basin.

The removal of impervious surfaces could lead to a minor local increase in infiltration to groundwater. However, only a small portion of total rainfall could potentially reach groundwater, as most would be lost through surface runoff, evaporation, and transpiration by vegetation. Average annual precipitation in the area is approximately 11.8 inches (see Table 4.3-1), nearly all falling in the winter months. Any annual accumulation in the groundwater would be less than that and unlikely to accumulate vertically over time due to levelling of any differential head during the dry season. Further, such accumulation of groundwater is not known to be a problem in adjacent similar areas that have never been developed.

Mitigation Measures

No MMs are recommended for Impact WQ-3.

Impact WQ-4: Erosion or Siltation due to Altered Drainage Patterns.

Removing structures and the underground drainage system would leave bare ground that could be subject to erosion and be a source of siltation **(Less than Significant with Mitigation).**

Impact Discussion

The Applicant proposes placing backfill material on top of the remaining subsurface SSCs. On sloping grades, consideration would be given to allow for sloping the structure during demolition or a stair-step removal to ensure the final grade provides adequate slope for drainage. Conversion of the site from a mostly paved, hard surface to bare ground would subject the site and backfill to erosion during rainfall events, particularly in areas of drainage concentration that would no longer have the protection of a hardened drainage conveyance system. Localized drainage concentrations, especially if on or in the bluff or other steep areas could cause substantial local erosion that could eventually affect adjacent property or damage habitat.

The subsurface drainage system would also be removed or modified, resulting in overland drainage to the existing openings at the top of the seawall. Areas not draining to the seawall, such as SYFA, would likely be graded to drain to the beach. Localized erosion of the post-demolition land surface and bluff could result from on-site and off-site runoff. Runoff with siltation could provide an additional, minor source of sand, but may degrade marine water and sediment, as discussed under Impacts WQ-2 and WQ-5. Final erosion and drainage work would be performed as instructed by the DoN and per SWPPP requirements.

If all or a portion of the subsurface drainage system remains, it would no longer be able to drain to the Intake Structure, requiring construction of a new opening in the seawall, or redirection of the remaining drainage to an existing opening, with no significant alteration to the drainage pattern. Drainage from the off-site area could be modified so that runoff flow is diverted prior to entering the site. Specifically, flow from one of the two 4-foot by 4-foot box culverts at Old Pacific Highway is routed under the SONGS south access road and contributes flow to the existing SONGS subsurface drainage system. This portion of the subsurface drainage system could be modified to drain directly to the beach. Depending on where this discharge point is located, there could be erosion on the bluff face or barranca wall due to concentration of flow and steep slopes.

In its APMs (see Table 4-2*, Applicant-Proposed Measures*), SCE commits to preparing the following plan to ensure that water quality standards and waste discharge requirements are adhered to, and there is no alteration of existing drainage patterns in a manner that would results in erosion or siltation.

APM-12: Stormwater Pollution Prevention Plan.

The implementation of APM-12 (as provided under Impact WQ-1) would reduce potential water quality impacts to a less-than-significant level during the activities described in Table 2-1. Subsequent to these activities and prior to final restoration under future activities (see Section 2.1), the following mitigation measure would reduce potential water quality impacts to a less-than-significant level.

Mitigation Measures

With implementation of **MM WQ-4**, measures would be taken to reduce water quality impacts during the period between completion of the Proposed Project activities and initiation of Future Activities.

MM WQ-4. ~~Interim Erosion Control~~Onshore Site Stabilization Plan. The Applicant ~~and/~~or its contractor shall prepare and implement an Onshore Site Stabilization Plan to cover the Onshore Site conditions following Proposed Project completion. This Plan shall include~~interim~~ erosion-control~~, plan, including~~ monitoring, and adaptive management measures, to prevent Proposed Project-induced fugitive dust and erosion that may occur ~~subsequent to the initial decommissioning activities~~after Proposed Project completion. Site stabilization would be accomplished either through the use of non-vegetative cover such as gravel, or vegetative cover through the application of a native erosion control mix. During preparation of the plan, the Applicant or its contractor shall consult with California State Lands Commission (CSLC), California Coastal Commission, and the San Diego Regional Water Quality Control Board~~, and Department of the Navy staffs~~, and a final copy provided to CSLC staff for review and approval a minimum of 60 days prior to start of ~~decommissioning~~ Proposed Project ground-disturbing activities. This Plan shall remain in effect until the beginning of Future Activities.

Impact WQ-5: Flooding due to Altered Drainage Patterns or Increased Surface Runoff.

Removing structures and the underground drainage system could increase flood-related effects **(Less than Significant with Mitigation).**

Impact Discussion

Removing the existing structures would reduce runoff from the site. However, prior to plugging or sealing the conduits, SCE proposes to eliminate or alter the subsurface drainage system to reroute flow to the beach. Two main drainage swales (one for each Unit) are in place to direct runoff to the seawall where openings at the top of the seawall (one per Unit) allow surface flow to the ocean (SCE 2016a – DR #1-15). Runoff over the seawall could potentially flood the Beach Access Walkway, although peak flow rates are not available at this time. The ocean is about 300 feet away, and no structure or facility would be subject to flood damage, except for potential impacts to the beach walkway, which could be a hazard to pedestrians.

Mitigation Measure

With implementation of **MM WQ-5**, water would not be discharged over the walkway, resulting in a less-than-significant impact.

MM WQ-5. Walkway Flood Protection Plan. In consultation with the California Coastal Commission (CCC)~~,~~ and the San Diego Regional Water Quality Control Board (RWQCB)~~, and Department of the Navy (DoN),~~ the Applicant ~~and/~~or its contractor shall prepare an alternate drainage plan that avoids discharging surface waters directly to the surface of the public access walkway. This may be accomplished by discharging under the walkway through culverts or other methods acceptable to the CCC~~ and DoN~~. Any discharge beneath the walkway shall be engineered to avoid damage to the walkway subgrade. The Applicant or its contractor shall submit the Plan to California State Lands Commission staff for review and approval in consultation with the CCC~~,~~ and RWQCB~~, and DoN,~~ a minimum of 60 days prior to start of ~~decommissioning~~ Proposed Project activities.

Impact WQ-6: Increased Ocean Turbidity and Marine Debris.

Offshore conduit decommissioning would result in increased turbidity and marine debris that could have temporary and localized impacts on marine water quality **(Less than Significant).**

Impact Discussion

As detailed in Section 2.3.6.4, *Offshore Dispositioning Approach*, offshore structures would be removed using underwater divers, a derrick barge, materials barges, and tug boats. Removed structures (debris) would be marked with temporary buoys, as needed, then loaded onto a barge with a high-capacity crane. During the removal of portions of the offshore Units 2 and 3 conduits and other associated in-water demolition activities, turbidity and the potential for unretrieved marine debris would increase.

Most seafloor disturbance would result from dredging and grading of the accumulated sediment, stone blanket, or backfill surrounding each vertical riser scheduled for removal. Associated in-water activities include the movement of the vertical risers (e.g., during removal, temporary placement on the seafloor), dredging and hydraulic pumping or possible sidecasting of dredged material on the seafloor (if hydraulic pumping is not feasible). Installation of mammal exclusion barriers and covers, and vessel and diver activity (e.g., during transport of equipment and waste), may also directly affect water quality. The total estimated disturbance area and dredge volume (see Table 2-6) is approximately 1.075 acres and 1,156 cubic yards, respectively. Indirect, temporary impacts to water quality due to turbidity may also occur as the marine sediment naturally shifts and stabilizes. Such impacts would be minimal and negligible, especially compared with the effect of decommissioning activities that directly disturb marine sediment.

Increases in turbidity have the potential to directly or indirectly affect marine organisms. For example, increased turbidity decreases the level of sunlight penetration into marine waters and can alter organism habitats, directly stress marine organisms (e.g., smother fish eggs, impair gill functioning), raise water temperatures, and affect the oxygen content of water (USEPA 2009). However, an increase in turbidity would need to be substantial or occur over an extended time to cause substantial mortality of marine organisms. For more information on turbidity effects on marine organisms, see the discussion of Impact BIO-13 in Section 4.4, *Biological Resources*. Since in-water activities would be temporary or intermittent (approximately 4 months [COWI 2017]), and the dredged volume would eventually be replaced at the dredged area by material supplied from the littoral system (see Section 4.7, *Geology, Soils, and Coastal Processes*). The following would reduce turbidity in the offshore Proposed Project area:

- Hydraulic pumping (or a similar technology) would be used to contain and remove suspended material during ~~conduit dispositioning~~ CSLC Lease Offshore Activity - related dredging.
- Rock from the stone blankets would be removed by hand or by using rigging.
- The horizontal intake and discharge conduits and remaining diffuser ports would be abandoned in place.
- Discharges through the offshore conduits would cease at the start of or during the Proposed Project.

While Project-generated marine debris during and immediately after Proposed Project activities may be elevated above the baseline condition, impacts to marine water quality would be temporary, localized to the lease area, and limited to a relatively brief period following removal. In addition, impacts would be minimized through adherence to the proposed Waste Management Program (APM-1).

A Dredging Plan (APM-15), would further protect marine water and sediment quality. The Dredging Plan would consist of protocols for dredging based on approved methods and standards set by the USACE, CSLC, California Coastal Commission (CCC), and RWQCB. The Dredging Plan would also propose appropriate methods for dealing with dredged material based on sediment sampling, testing, and analysis results (e.g., conducted according to the SAP). The Dredging Plan would need to include measures to prevent or minimize impacts to marine water quality and be implemented accordingly to adequately reduce the impacts of dredging. Additionally, turbidity monitoring (APM-16) would be required daily during offshore dredging and construction to ensure turbidity levels are acceptable.

In its APMs (see Table 4-2, *Applicant-Proposed Measures*), SCE commits to a Dredging Plan and turbidity monitoring to ensure that marine resource impacts would be minimized.

APM-1. Waste Management Program (Section 4.1, *Hazardous and Radiological Materials*).

APM-15. Dredging Plan. To protect marine water quality during dredging and related offshore activities, the Applicant ~~and/~~or its contractor shall develop and implement a Dredging Plan prior to Proposed Project offshore activities. The Dredging Plan shall include protocols for dredging based on approved methods and standards set by the U.S. Army Corps of Engineers (USACE), California State Lands Commission (CSLC), California Coastal Commission (CCC), and the San Diego Regional Water Quality Control Board (RWQCB), including but not limited to:

- Number and type of vessels required to conduct dredging~~.~~
- Information on the specific location of intended side-casting areas for each structure if using a long-reach excavator or similar method is intended. Including the predominant habitat type of the side-casting area (hard or soft sediment, presence of aquatic vegetation or other seabed habitat likely to be impacted)
- Requirements to avoid areas of sensitive habitat; particularly rocky reefs and seagrass beds. If no seabed areas with suitable soft sediment habitat for side-casting exists within the proximity of the structures intended for removal, the contractor must consider diver-guided suction dredging methods that remove sediment to either the discharge conduits, or relocation of sediments to an appropriate side-casting location.
- Deployment of a floating boom and skirt around offshore and shoreline Proposed Project activities to prevent or minimize impacts to marine water quality.
- Appropriate methods for dealing with dredged material based on sediment sampling, testing, and analysis results.

The Applicant <u>or its contractor</u> shall submit the Dredging Plan to CSLC staff, for review and approval by CSLC staff in consultation with the USACE, CCC, and RWQCB, not less than 30 days prior to commencement of Proposed Project offshore work.

APM-16. Turbidity Monitoring. Turbidity monitoring shall be performed during Proposed Project offshore work to monitor any effects on water clarity in the immediate areas of the offshore work. Work shall be performed by a qualified water quality specialist who shall record turbidity from a suitable vantage point during each day of offshore dredging and decontamination and dismantlement. The Applicant ~~and/~~or its contractor shall send weekly electronic copies of the turbidity monitoring reports for review by California State Lands Commission and San Diego Regional Water Quality Control Board staffs.

With implementation of APM-1, APM-15, and APM-16, impacts due to marine debris and ocean turbidity would be less than significant.

Mitigation Measures

No MMs are recommended for Impact WQ-6.

Impact WQ-7: Degraded Marine Water Quality from Oil or Chemical Spills.

Potential chemical spills in and adjacent to the ocean during facilities demolition could substantially degrade marine water quality **(Less than Significant).**

Impact Discussion

There is the potential for offshore Proposed Project activities to result in chemical spills that could affect marine water quality. The frequency and size of chemical spills into the marine environment may increase from baseline levels because of demolition activities at the onshore facilities (e.g., equipment refueling) or in-water activities. During in-water activities, equipment and vessels working in or over the water may leak or spill chemicals (e.g., fuel, lubricants, dredged sediment that may be contaminated). Generally, the greatest risk of an oil spill (and other chemical spills) is release from a storage tank.

Spill prevention and management measures would be in place during the Proposed Project to address various possible spill mechanisms, including release from a storage tank. An Offshore Spill Response Plan, as described in Section 2.0, *Project Description*, is proposed as APM-17 to define procedures and protocols to be used in the event of an offshore spill or leakage of fuel or lubricants. Due to the spill response measures included in this plan, spills into marine waters would be prevented or otherwise minimized. With implementation of these measures, spills would be contained, managed, or remediated promptly, and thus would have only potentially minor or negligible impacts to marine water quality. As a result, impacts to marine water quality would be less than significant.

In its APMs (see Table 4-2, *Applicant-Proposed Measures*), SCE commits to preparing various plans to ensure that impacts to marine water quality would be minimized.

APM-17: Offshore Spill Response Plan. As part of the Spill Prevention Control and Countermeasure Plan, the Applicant ~~and/~~or its contractor shall prepare an Offshore Spill Response Plan that shall, at a minimum, include:

- Procedures and protocols to be used in the event of an offshore oil spill.
- Discussion of potential sources of hydrocarbons (limited to leakage or spillage of fuel or lubricants from onshore and from marine equipment used during dispositioning operations).
- Description of marine spill scenarios and response procedures to be used in the event of an onshore or offshore oil or chemical spill.
- List of the spill response team members, including contact information and the notification process.
- Shipboard copies of the Plan and all necessary equipment to implement said Plan onboard.

The Applicant or its contractor shall submit the Plan to California State Lands Commission (CSLC) staff, for review and approval by CSLC staff, for review and approval in consultation with the Office of Spill Prevention and Response a minimum of 60 days prior to commencement of ~~conduit disposition~~ CSLC Lease Offshore Activity ~~work~~ operations.

With the implementation of APM-17, impacts to marine water quality due to oil or chemical spills would be less than significant.

Mitigation Measures

No MMs are recommended for Impact WQ-7.

4.9.5 Cumulative Impacts

With regard to hydrology and water quality, any project with the potential to discharge liquid or other materials into the environment (especially fuel, or other chemicals) or to involve vessel traffic, would have the potential to contribute to cumulative effects. As discussed in Section 3.2, *Relevant Cumulative Projects*, and shown in Table 3-2, 20 reasonably foreseeable cumulative projects fall within the geographic area near SONGS considered for potential cumulative impacts related to hydrology and water quality.

Projects involving vessel traffic and marine seafloor activities would have the most potential for contributing cumulative effects to marine water quality for the Proposed Project. These projects include the Wheeler North Reef Expansion, Palos Verdes Reef Restoration Project, the Camp Pendleton Seawater Desalination Project Intake Testing Program, the Doheny Ocean Desalination Plant, and Seawater Desalination Project at Huntington Beach (see Sections 3.2.3 through 3.2.7 in Section 3.0, *Cumulative Projects*, as well as Cumulative Projects ID Nos. 45-47 in Table 3-2). The Doheny Ocean Desalination Plant proposes no in-water vessel activities. During in-water activities for these projects, vessels may spill substances (e.g., fuel, dredged sediment) into the marine environment. Of these three projects, only the Wheeler North Reef Expansion and Seawater Desalination Project at Huntington Beach include in-water construction activities that may overlap with the offshore demolition timeline for the Proposed Project. Since in-water activities for the Palos Verdes Reef Restoration Project would precede and not overlap with those of the Proposed Project, this project is expected to contribute only negligible impacts to the Proposed Project. The other two projects must meet regulatory requirements protective of marine water quality—including reduction of the probability and consequences of accidental releases to the marine environment. Therefore, these two projects are also expected to contribute only negligible cumulative impacts associated with water quality.

Agua Hedionda Routine Maintenance Dredging (Table 3-2, ID No. 26), seawall improvements for The Strand (Table 3-2, ID No. 36), and Opportunistic Beach Fill

Program (Table 3-2, ID No. 37), and North County Transit District projects involving bridge replacement activities over water (Table 3-2, ID Nos. 42 and 43) could also contribute to cumulative effects to marine water quality. These short-duration projects must meet applicable regulatory requirements for protection of marine water quality. Because the Proposed Project is not within a groundwater basin and is not expected to adversely affect groundwater, the Proposed Project's contribution to cumulative groundwater impacts are negligible. Local drainage patterns and flood peaks could be adversely affected by cumulative projects; however, the Proposed Project would have a negligible contribution to overall flood peaks due to its proximity to the ocean, meaning there would be no opportunity for a combination of increased flood peaks, nor would the Proposed Project increase local flood peaks or significantly alter local flood patterns.

4.9.6 Future Activities

Future Activities of the SONGS Decommissioning Plan are not part of the Proposed Project. As many Plan activities are still undetermined in terms of scope and timing, the impacts are speculative. Future Activities that are relevant to hydrology and water quality include removal of the solid covers from the mammal exclusion barriers on the Unit 2 discharge conduit, and if required by the Commission, removal of remaining discharge conduit diffuser ports. Other activities would include the modification or removal of the riprap, walkway, seawall, and gunite slope protection. These activities have the potential to result in chemical spills, increased turbidity or debris in or near the ocean, and any land-based activities (e.g., final site restoration) could increase the potential to result in discharges of chemicals or physical materials to the ocean via surface runoff.

Removal of the solid covers from the marine mammal exclusion barriers on the Unit 2 discharge conduit and the remaining conduit diffuser ports, and modifying or removing the riprap, walkway, seawall and gunite slope protection, would result in increases in marine turbidity or debris. However, these activities must be implemented according to applicable regulatory requirements for protection of marine water quality (e.g., via vehicle and equipment fuel spill prevention and management measures). Any turbidity increases, or debris dislodged during these activities would result in localized and temporary effects. Surface water impacts would be related to contamination from demolition and re-construction activities, with a potential for increased erosion. Although the potential for erosion may be increased, the post-demolition configuration could be closer to that of a natural beach, which is naturally subject to ongoing erosion and alteration by water, resulting in no significant adverse impact. Thus, such activities would not result in any permanent significant impacts to water quality.

4.9.7 Summary of Proposed Mitigation Measures

Table 4.9-5 provides a summary of the mitigation and Applicant-proposed measures.

Table 4.9-5. Hydrology and Water Quality Impact/Mitigation Summary

Impact	MM/APM
WQ-1: Violation of Water Quality Standards or Waste Discharge Requirements, or Generation of Substantial Additional Sources of Polluted Runoff	APM-1: Waste Management Program APM-2: Hazardous Materials Business Plan APM-12: Stormwater Pollution Prevention Plan (SWPPP) APM-13: Spill Prevention Control and Countermeasure (SPCC) Plan APM-14: Spill Contingency Plan
WQ-2: Groundwater Characterization and Discharge	MM HAZ-6: Soil and Groundwater Site Characterization ~~Study~~ and Soil Management Plan
WQ-3: Groundwater Depletion or Reduced Recharge	None recommended
WQ-4: Erosion or Siltation due to Altered Drainage Patterns	APM-12: Stormwater Pollution Prevention Plan MM WQ-4: ~~Interim Erosion Control Plan~~Onshore Site Stabilization Plan
Impact WQ-5: Flooding due to Altered Drainage Patterns or Increased Surface Runoff.	MM WQ-5: Walkway Flood Protection Plan
WQ-6: Increased Ocean Turbidity and Marine Debris	APM-1: Waste Management Program APM-15: Dredging Plan APM-16: Turbidity Monitoring
WQ-7: Degraded Marine Water Quality from Oil or Chemical Spills	APM-17: Offshore Spill Response Plan

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4.10 LAND USE AND PLANNING

This section describes existing land use and planning conditions in the Proposed Project vicinity, identifies applicable land use plans and significance thresholds, assesses the Proposed Project's land use impacts and their significance, and recommends measures to avoid or substantially reduce any effects found to be potentially significant.

4.10.1 Environmental Setting

The U.S. Department of Navy (DoN)-owned land where onshore decommissioning would occur (DoN Property) covers about 99 acres: an 84-acre easement for the former nuclear power plant; two adjacent leased parcels, including parking lots and laydown/storage land comprising approximately 15 acres; and easements for an access road and rail spur. This site is within ~~the 195-acre~~ Marine Corps Base Camp Pendleton (MCBCP), which occupies over 125,000 acres and is bordered by about 17 miles of coastline. In addition, portions of the 5-mile study area fall within the coastal zone. All on-site decommissioning activities would occur within the DoN Property and on California State Lands Commission (CSLC) Lease PRC 6785.1 offshore. For this analysis, the study area is defined as the land uses and planning conditions within a 5-mile radius of the Proposed Project site, which includes the area within and offshore MCBCP as well as San Onofre State Beach and part of the city of San Clemente (see Figure 4.10-1). A 5-mile radius was selected because all short- and long-term direct and indirect impacts associated with land use are reasonably expected to occur within this area or closer to the Proposed Project site.

4.10.1.1 Marine Corps Base Camp Pendleton

MCBCP is the U.S. Marine Corps' amphibious (air, land, and sea) military training center. Land uses include military training, Base infrastructure and mission support, and real estate agreements and leases (MCBCP 2012). Training activities include amphibious landings, tracked vehicle use, personnel maneuvers, artillery and small arms firing, aerial weapons delivery, logistics and field combat service and airlift support, communications, equipment maintenance, and field medical treatment within 31 training areas, five impact areas, more than 100 live-fire facilities, five landing beaches, and about 230 square miles of Special Use Airspace (EDAW 2010). The Camp Pendleton Amphibious Assault Area in the ocean west of MCBCP includes amphibious assault training and maneuvering areas and a seaward portion of restricted airspace (MCBCP 2012).

The MCBCP supports military personnel and their families with facilities and services, including housing, water, sewage, solid waste disposal, recycling, medical and dental care, schools, child care, and recreational opportunities. Within the 5-mile study area are housing areas and beaches (see Table 4.10-1). Real estate agreements, which cover approximately 4,350 acres of MCBCP, include leases, easements, or assignments for public utilities, such as SONGS, public transit corridors, and State Beach leases.

Figure 4.10-1. Land Use

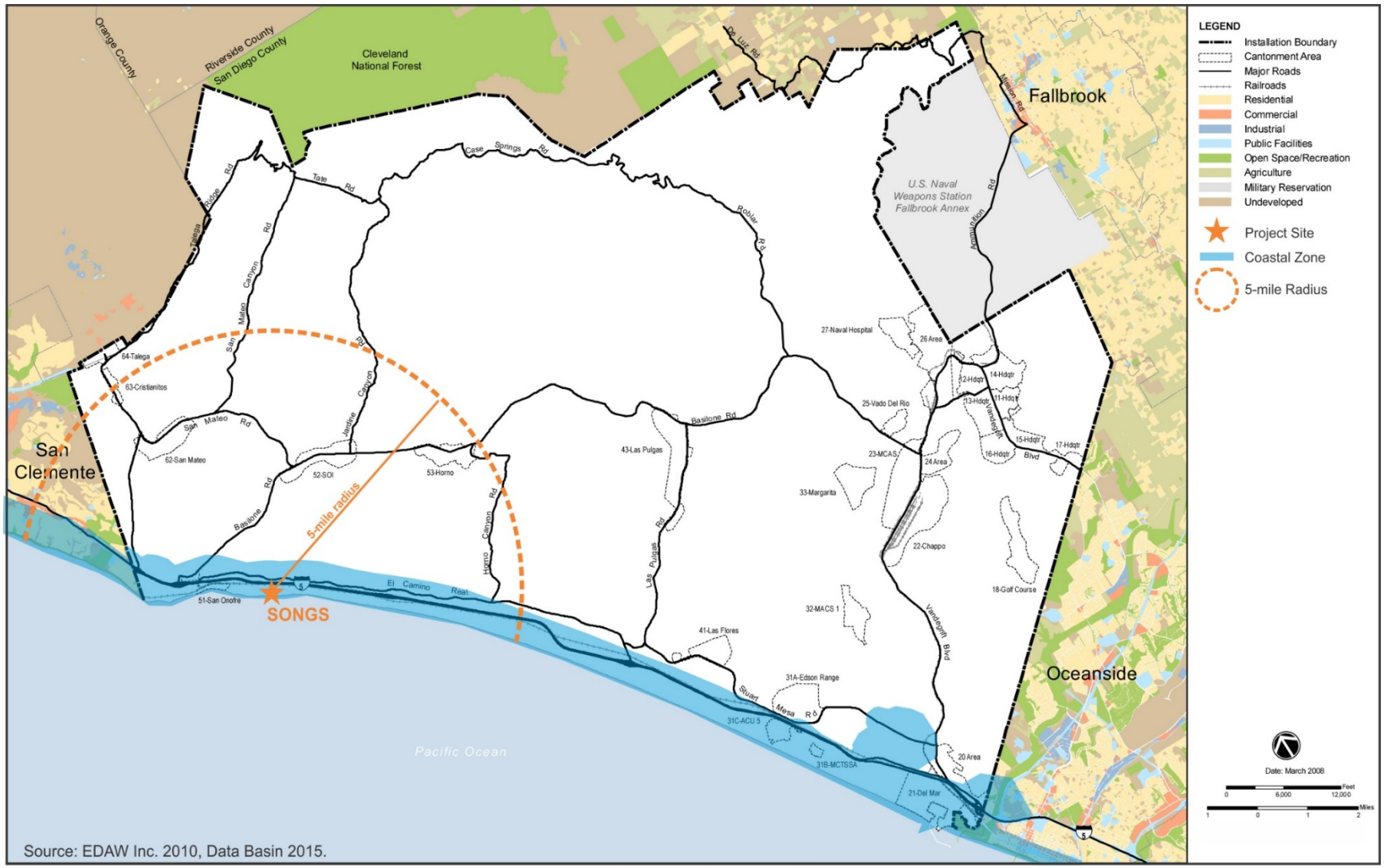


Table 4.10-1. MCBCP Land Uses in the Study Area

Area	Land Uses/Attributes
Green Beach	• Beach range training area located west/northwest of the Proposed Project site (Amphibious Assault Area and Amphibious Vehicle Training Area) • Flanked on both sides by San Onofre State Beach (see Section 4.12, *Recreation and Public Access*)
San Onofre Housing Area (51 Area)	• Located approximately 2 miles south/southeast of the City of San Clemente • Neighborhoods San Onofre 1, 2 and 3 contain 100 officer housing units and 800 enlisted housing units, totaling 900 housing units; the San Mateo Point Housing Area is made up of 76 multi-family officer homes
Seaside Square (51 Area)	• Community services area including a Community Center, Youth Center, Child Development Center, restaurants and shops, and a gas station and auto service center • Associated community services include the San Onofre Beach cottages and campgrounds (see Section 4.12, *Recreation and Public Access*)
School of Infantry (52 Area)	• Located among the coastal hills of the San Onofre Creek canyon, approximately 4 miles east of the MCBCP's San Onofre Gate • 338 acres, of which approximately 185 acres are developed • Existing land uses: training and operations, maintenance, storage/supply, medical, administration, housing, community, and utilities/paved areas
Horno Area (53 Area)	• Located in the interior of MCBCP between the San Onofre Hills and the Santa Margarita Mountains, approximately 3 miles east of the ocean • 258 acres, of which approximately 98 acres are developed • Existing land uses: training and operations, maintenance, storage/supply, medical, administration, housing, community, and utilities/paved areas
San Mateo Area (62 Area)	• Situated in the coastal hills area at the northern end of MCBCP, approximately 3 miles east of the MCBCP's San Onofre Gate • 310 acres in size, of which approximately 89 acres are developed • Existing land uses: training and operations, maintenance, storage/supply, medical, administration, housing, community, utilities/paved areas, and temporary facilities
Gold Beach	• Located south/southeast of the Proposed Project site and San Onofre State Beach • Amphibious Assault Area and Amphibious Vehicle Training Area
Quebec Impact Area	• Located in MCBCP's North Area, north/northeast of San Mateo Road. The Quebec Impact Area supports weapons training that may produce "duds," such as artillery, bombs, and the firing of high explosive munitions • Access to dud-producing impact areas is tightly controlled for safety reasons
Whiskey/Zulu Impact Area	• Located within and north of MCBCP's Central Area north/northeast of Basilone Road; the Whiskey and Zulu Impact Areas also support weapons training that may produce "duds" (see Quebec Impact Area)

Sources: EDAW 2010; MCBCP 2012.

Within MCBCP, the coastal zone is generally 3,000-feet-wide; at the Proposed Project site, the coastal zone extends east/northeastward, crossing Interstate (I-) 5, for about 3,000 feet (Data Basin 2015).

4.10.1.2 City of San Clemente

The southern portion of the city of San Clemente (City) in southern Orange County is within the 5-mile study area (Figure 4.10-1). It is 18.36 square miles in size with a water area of 0.76 square mile (California Hometown Locator 2016). Existing land uses in this portion of San Clemente are a mixture of residential, commercial, open space/recreation, public facilities, and undeveloped uses. General Plan land use designations include:

- Coastal and Recreation Serving Commercial (CRC)
- Community Commercial 2 and 3 (CC2 and CC3)
- Neighborhood Commercial 1.3 and 2 (NC1.3 and NC2)
- Mixed Use 3.2, 4 and 5 (MU3.2, MU4, and MU5)
- Public (P)
- Residential Very Low, Low, Medium, and High Density (RLV, RL, RM, and RH)
- Open Space Public (OS1)
- Open Space Private (OS2)

The western portion of the City is in the coastal zone (City of San Clemente 2016a). From south to north, the coastal zone boundary follows the east side of I-5 to a point north of Avenida Mendocino, trends westward to Avenida del Presidente, continues to the northwest to West Avenida Valencia, then continues to parallel the coast (Data Basin 2015).

4.10.2 Regulatory Setting

The primary federal and state laws, regulations, and policies that pertain to the Proposed Project are summarized in Appendix A. Plans adopted by local governments containing goals, policies, and objectives relevant to land use and planning are summarized below. Although the City falls within the land use and planning study area, it has no jurisdictional authority over the Proposed Project. Therefore, an analysis of the Proposed Project's possible conflicts with the City's adopted land use goals and policies is not applicable.

4.10.3 Significance Criteria

The significance criteria used to evaluate the Project impacts to land use and planning are based on Appendix G of the State CEQA Guidelines. According to Appendix G of the State CEQA Guidelines, a significant impact would occur if the Project would:

- Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the Proposed Project, adopted for the purpose of avoiding or mitigating an environmental effect, including the California Coastal Act (Coastal Act).
- Disrupt, displace, or divide either existing or approved planned land uses, including potentially sensitive land uses.

4.10.4 Environmental Impact Analysis and Mitigation

The location of the Proposed Project was planned, in part, to isolate the facility from other land uses. Nonetheless, the Proposed Project has been evaluated to assess whether it would cause disruptions to surrounding land uses or otherwise conflict with the land use plans, policies, and regulations of agencies having jurisdiction over decommissioning activities. Table 4.10-3 at the end of this section summarizes the potential impacts of the Proposed Project as related to land use and planning and any mitigation or Applicant-proposed measures (APMs) recommended to reduce impacts to a level that is less than significant.

ENVIRONMENTAL IMPACT ANALYSIS

Impacts of the proposed Project and recommended mitigation measures (MMs) are examined in this section.

Impact LU-1: Consistency with Applicable Land Use Plans, Policies, or Regulations.

Proposed Project activities would be consistent with applicable land use plans, policies, and regulations of agencies with jurisdiction over the Proposed Project, including the California Coastal Act **(No Impact).**

Impact Discussion

From a land use and planning perspective, the agencies having jurisdiction over the Proposed Project include the CSLC, DoN, and California Coastal Commission (CCC).

The Applicant's current lease with the CSLC (PRC 6785.1) to use 21 acres of tide and submerged lands for the offshore portion of SONGS expires in 2023 (see Section 1.2.2.1, *California State Lands Commission*). The Applicant is seeking CSLC approval for a new lease to cover the anticipated decommissioning period (2019 to 2035), and authorize continued use of the riprap until the beginning of the Future Activities portion of the SONGS Decommissioning Plan, which are estimated to begin in 2035.

The DoN's adopted land use plans, policies, and regulations are found in the MCBCP 2030 Base Master Plan (Master Plan) (EDAW 2010) and Integrated Natural Resources Management Plan (INRMP) (MCBCP 2012). As summarized in Table 4.10-2, the Proposed Project would be consistent with these adopted plans.

The CCC's jurisdiction over lands within the coastal zone is set forth in the California Coastal Act (Pub. Resources Code, § 30000 et seq.), and the CCC has issued coastal development permits (CDPs) for several existing components of SONGS, including the construction and operation of SONGS Units 2 and 3 and, more recently, onshore storage of spent nuclear fuel (SNF) in the Approved ISFSI (see Sections 1.2.2.2, *California*

Coastal Commission, and 1.5.1, *Baseline and Future Conditions*). The CCC may also issue new or amended CDPs for decommissioning activities associated with the offshore conduits depending on the CSLC's approved final disposition of the offshore infrastructure. Because the CCC has not yet considered the approval of a CDP for the Proposed Project, no official determination of consistency with the Coastal Act has been made by the CCC. In its review and decision-making process for decommissioning, the CCC would have the opportunity to condition the Proposed Project, including ~~o~~Offshore Site and ~~o~~Onshore ~~s~~Site restoration, in a manner that supports and implements the enforceable policies of the Coastal Act while minimizing adverse environmental effects. As such, no inconsistency with the Coastal Act is anticipated.

Table 4.10-2 Consistency with MCBCP Land Use Plans and Policies

Plan, Policy, Regulation	Proposed Project Consistent?	Discussion of Consistency
2030 Base Master Plan (Master Plan) (Volumes I, II, III)	Yes, with extension of the easement agreements to occupy the land until completion of decommissioning	The purpose of the Master Plan is to establish comprehensive, long-range land use plans and strategies to implement current and future requirements for the efficient operation of MCBCP. The Master Plan has a planning horizon to the year 2030. Volume I contains the Executive Summary. Volume II describes the MCBCP's existing facilities and their respective condition. Volume III contains Area-specific plans that also describe existing conditions, outline future development concepts, and present recommendations and guidelines for future development, including those for environmentally sensitive resources. In the Master Plan, SONGS is identified as a manmade development constraint. However, none of the applicable Area-specific plans contain future development plans for the Proposed Project site. As such, SONGS decommissioning and dismantlement and ~~conduit disposition~~ CSLC Lease Offshore ~~a~~Activities do not currently conflict with future development plans.
Integrated Natural Resources Management Plan (INRMP)	Yes, with extension of the easement agreements to occupy the land until completion of decommissioning	The purpose of the INRMP is to provide for the conservation and rehabilitation of natural resources on MCBCP. The INRMP ensures that natural resource use is~~:~~ sustainable, in accordance with laws and regulations, and optimally integrated with existing military installation plans and mission requirements. The INRMP notes that SONGS is a constraint to military training activities, and has created artificial restrictions for maneuvers inland from the coast. Implementation of the Proposed Project could temporarily disrupt military activities, but any disruptions would not represent a substantial change from baseline conditions. However, all decommissioning-related activities within MCBCP would be conducted at the sole discretion of the Department of the Navy through its Commanding Officer and chain of command, which are required to comply with applicable laws and regulations.

The jurisdictional responsibilities of the California Department of Parks and Recreation (DPR) are also relevant due to the Proposed Project's proximity to San Onofre State Beach (see Table 1-7, *Other Anticipated SONGS Decommissioning Plan Approvals*). However, the Applicant does not plan to use or access San Onofre State Beach. The San Onofre State Beach Revised General Plan does not address SONGS decommissioning, but did refer to increased vehicle and train traffic during the facility's original construction, and increased risk of public exposure to hazardous conditions during its operation. Information on potential impacts of decommissioning on San Onofre State Beach are addressed in Sections 4.1, *Hazardous and Radiological Materials*, 4.12, *Recreation and Public Access*, and 4.13, *Transportation and Traffic*.

Mitigation Measures

No MMs are recommended for Impact LU-1.

Impact LU-2: Disrupt, Displace, or Divide Existing or Approved Land Uses.

Land uses, including sensitive land uses, could be disrupted by decommissioning activities **(Less than Significant with Mitigation).**

Impact Discussion

Land uses surrounding the Proposed Project site are described in Section 4.10.1*, Environmental Setting*. Within the 5-mile study area, sensitive land uses within MCBCP include residential neighborhoods in the San Onofre Housing Area, and the Community, Youth, and Child Development Centers within Seaside Square. Within the City, sensitive land uses include the Concordia Elementary School, Las Palmas Elementary School, San Clemente High School, and Lobo Elementary School (Capistrano Unified School District 2017), as well as the San Clemente Community Center (Google Earth 2017). Land uses, including sensitive land uses, adjacent to Proposed Project activities within MCBCP could be periodically disrupted due to increased traffic, noise, and dust. This would likely occur to varying degrees during the Proposed Project, but particularly during peak decontamination and dismantlement (D&D) activities.

As outlined in Table 1-3, *Timeline Associated with SONGS State Leases (1960-2016)*, SONGS was constructed between the mid-1960s and 1984. As part of the review and approval process for its construction and operation, no other land uses in or near MCBCP were planned or constructed. As such, no MCBCP land uses, including sensitive land uses, would be physically displaced or divided by Proposed Project activities. Therefore, no impacts would occur. Upon full decommissioning, MCBCP may elect to either redevelop the Proposed Project site with new land uses, or use the Proposed Project site to extend amphibious military training operations from Green Beach.

The distance between the Proposed Project site and the city of San Clemente, however, is great enough to minimize any direct impacts to land uses, including sensitive land uses, to a less-than-significant level. Indirect impacts due to increased traffic volumes could cause minor disruptions to existing and planned land uses. As detailed in Section 4.13, *Transportation and Traffic*, traffic impacts in the city of San Clemente vicinity can be mitigated to a less-than-significant level. Therefore, indirect impacts to existing and planned land uses would be less than significant or no impact.

Mitigation Measures

MM LU-2a through **MM LU-2c** are proposed to provide MCBCP operations and residents within 5 miles of the Proposed Project site with notification of planned decommissioning activities prior to their implementation, as well a point of contact for the correction of any disturbances that may occur. With implementation of these MMs, impacts related to land use disturbances would be less than significant.

MM LU-2a: Deconstruction Liaison. MM LU-2a: Deconstruction Liaison. At least 1 month prior to the start of any deconstruction activities, and thereafter for the duration of the Project, the Applicant or its contractor shall appoint a Deconstruction Liaison and provide a toll-free general number and the name and contact information for the liaison (or liaisons) for all Marine Corps Base Camp Pendleton (MCBCP) operations and residents within 5 miles of the Project site by U.S. Postal Service mail. The identified liaison(s) shall:

- Act as a point of contact and interface between MCBCP personnel and local residents and the San Onofre Nuclear Generating Station deconstruction crews
- Be available both in person and by phone, as necessary, for at least 1 month prior to the start of deconstruction, and for 6 months following the completion of the Project
- Respond to all Project-related questions and concerns within a 72-hour period when contact information is provided

In addition, the Applicant or its contractor shall provide the California State Lands Commission and Department of the Navy staffs with summary documentation of all complaints, comments, and concerns communicated to the liaison(s) every 3 months for the duration of deconstruction activities, and 2 times (once every 3 months) for the 6-month period following the completion of Project activities. The compliance documentation shall include the name and address of the person contacting the liaison(s), the date of contact, and what actions were taken by the liaison(s) to rectify or address the complaints, comments, or concerns expressed.

MM LU-2b: Advance Notification of Deconstruction. The Applicant or its contractor shall give at least 30 days advanced notice of the start of any deconstruction activities to Marine Corps Base Camp Pendleton operations and residents within 5 miles of the Project site by U.S. Postal Service mail. The

notification shall include the location, types, and expected duration of each deconstruction activity scheduled for the first 3 months following publication of the notification. The notification shall also include the toll-free general phone number and contact information for the deconstruction liaison(s), as well as an internet website address where additional information related to deconstruction activities can be found.

MM LU-2c: Quarterly Deconstruction Updates. Following distribution of the advance notification of deconstruction, the Applicant or its contractor shall provide Marine Corps Base Camp Pendleton operations and residents within 5 miles of the Project site with updates to all current and scheduled deconstruction activities on the Project's internet website and by U.S. Postal Service mail. The updates shall be provided every quarter for the duration of deconstruction activities. The updates shall continuously include the location, types, and expected duration of each deconstruction activity scheduled for the 3-month period following each update's publication date. The updates shall also include a toll-free number and the name and phone number of the deconstruction liaison(s) to respond to all deconstruction-related questions and concerns.

4.10.5 Cumulative Impacts

As discussed in Section 3.2, *Relevant Cumulative Projects*, and shown in Table 3-2, nine reasonably foreseeable cumulative projects fall within the geographic area near SONGS considered for potential cumulative impacts related to land use and planning. Most of the cumulative projects within the MCBCP are completed, under construction, or have been approved for implementation; thus, their respective decision-makers found them to be both consistent with applicable land use plans, policies, or regulations. Of the remaining projects that are currently under environmental review, consistency with applicable plans and policies would likely be a requirement for their approval. Therefore, the Proposed Project would not incrementally contribute to any cumulative effects associated with Impact LU-1.

The Proposed Project could periodically disrupt land uses during deconstruction activities, including sensitive land uses, within the MCBCP. These impacts can be mitigated to a less-than-significant level with implementation of MM L-2a, MM LU-2b, and MM L-2c. Although the cumulative projects within the MCBCP would likely have similar types of periodic disruptions during their respective construction phases, except for the SONGS Mesa Environmental Investigation and Remediation Project (ID No. 2 in Table 3-2), their construction would not likely overlap with the Proposed Project. Therefore, the Proposed Project's contribution to Impact LU-2 with incorporation of MM LU-2a, MM LU-2b, and MM LU-2c would not be cumulatively considerable.

4.10.6 Future Activities

CCC proceedings would be required for issuance of a CDP for Future Activities associated with SONGS decommissioning. Assuming the CCC can make the findings that Future Activities comply with Public Resources Code Division 20, particularly as related to Chapter 3 (Coastal Resources Planning and Management Policies), no inconsistencies would occur. The DoN has authority for final site restoration activities and may elect to redevelop the SONGS site with new land uses or use the Proposed Project site to extend amphibious military training operations from Green Beach, which may be viewed as a beneficial impact. These activities would need to be completed consistent with the MCBCP Master Plan and INRMP. Land uses adjacent to SONGS within MCBCP could also be disrupted due to increased traffic, noise, and dust, resulting in a potentially significant impact. **MM LU-2a**, **MM LU-2b**, and **MM LU-2c** could be implemented to reduce such impacts.

4.10.7 Summary of Proposed Mitigation Measures

Table 4.10-3 provides a summary of the mitigation and Applicant-proposed measures.

Table 4.10-3. Land Use/Planning Impact/Mitigation Summary

Impact	MM/APM
LU-1: Consistency with Applicable Land Use Plans, Policies, or Regulations	None recommended
LU-2: Disrupt, Displace, or Divide Existing or Approved Land Uses	MM LU-2a: Deconstruction Liaison MM LU-2b: Advance Notification of Deconstruction MM LU-2c: Quarterly Deconstruction Updates

4.11 NOISE

This section provides information regarding the fundamentals of noise, describes the existing noise environment in the Proposed Project area, identifies applicable significance thresholds, assesses the Proposed Project's noise impacts and their significance, and recommends measures to avoid or substantially reduce any effects found to be potentially significant. Alternatives to the Proposed Project and their associated noise impacts are discussed in Section 5.0, *Project Alternatives Analysis*.

4.11.1 Environmental Setting

The study area for the noise analysis considers noise sensitive uses near the San Onofre Nuclear Generating Station (SONGS), which are related to recreational uses in the area (see Figure 4.12-1 in Section 4.12, *Recreation and Public Access*). The study area includes lands under the jurisdiction of Marine Corps Base Camp Pendleton (MCBCP), California State Lands Commission (CSLC), California Department of Parks and Recreation (DPR), and the City of San Clemente. The underwater noise influence area extends offshore beyond the end of the 8,400-foot-long SONGS Unit 2 discharge conduit.

4.11.1.1 Fundamentals of Noise

Noise may be described as unwanted sound and is objectionable if it is disturbing or annoying; sound is typically described by its pitch (height or depth of a tone or sound) and loudness (amplitude or intensity of sound waves combined with the ear's reception characteristics). The amplitude of pressure waves generated by a sound source determines the loudness of that source. In general, intermediate pitched signals sound louder to humans than sounds with a lower or higher pitch. Sound pressure amplitude is measured in micropascals (µPa), where 1 µPa equals approximately one hundred-billionth (0.00000000001) of normal atmospheric pressure. Sound pressure amplitudes for different noise environments can range from less than 100 to 100,000,000 µPa. Because of this large range, sound pressure level (sound level) is often expressed in decibels (dB) or A-weighted decibels (dBA; an expression of the relative loudness of sounds in air as perceived by the human ear), a logarithmic scale where a doubling of sound energy corresponds to a 3-dB increase in acoustic energy, a 10-dB increase is 10 times more intense, a 20-dB increase is 100 times more intense, etc.[49] The threshold of hearing for young people is about 0 dB, which corresponds to 20 µPa. For underwater sounds, a reference pressure of 1 µPa is commonly used to describe sounds in terms of decibels (underwater, 0 dB on the decibel scale would correspond to 1 µPa).

[49] Because decibels are logarithmic units, sound pressure levels cannot be added or subtracted through ordinary arithmetic. When two identical sources each produce sound of the same loudness, their combined sound level "doubles" or at a given distance would be 3 dB higher than one source under the same conditions. For example, if one excavator produces a sound pressure level of 80 dBA, two excavators would combine to produce 83 dBA not 160 dBA.

Four sound level descriptors that are commonly used in this environmental noise analysis can be found in Table 4.11-1.

Table 4.11-1. Definitions of Common Sound Level Descriptors

Term	Definition
Equivalent Noise Level (Leq)	Average A-weighted noise level during the measurement period. The hourly Leq used for this report is denoted as dBA Leq[h].
Maximum Sound Level (Lmax)	The maximum A-weighted noise level measured during a specific period.
Minimum Sound Level (Lmin)	The minimum A-weighted noise level measured during a specific period.
Community Noise Equivalent Level (CNEL)	Average A-weighted noise level during a 24-hour day, which is obtained by adding 5 dB to sound levels in the evening from 7:00 p.m. to 10:00 p.m. and 10 dB to sound levels at night between 10:00 p.m. and 7:00 a.m.
Day/Night Noise Level (Ldn)	Average A-weighted noise level during a 24-hour day (obtained by adding 10 dB to sound levels measured at night between 10:00 p.m. and 7:00 a.m.

Airborne Sound Propagation

When airborne sound propagates over a distance, it changes in both level and frequency content. The way noise is reduced with distance depends on the following important factors identified in Table 4.11-2.

Table 4.11-2. Airborne Sound Propagation Factors

Geometric Spreading from Point Sources	Sound from a single source (i.e., a “point” source) radiates uniformly outward as it travels away from the source in a spherical pattern. The sound level attenuates (or drops off) at a rate of 6 dBA for each doubling of distance (intensity drops to one-quarter of the previous level with each doubling of distance).
Geometric Spreading from Line Sources	Some sound generators, such as highway noise, are not single stationary point sources of sound. The movement of vehicles on a highway makes the source of the sound appear to emanate from a “line” source rather than a point. The change in sound level from a line source is 3 dBA per doubling of distance (intensity drops to half of the previous level with each doubling of distance).
Ground Absorption	Usually the noise path between the source and the observer is very close to the ground. The excess noise attenuation from ground absorption occurs due to acoustic energy losses on sound wave reflection. Traditionally, the excess attenuation has also been expressed in terms of attenuation per doubling of distance. This approximation is done for simplification only; for distances of less than 200 feet, prediction results based on this scheme are sufficiently accurate. For acoustically “hard” sites (i.e., sites with a reflective surface, such as a parking lot or a smooth body of water, between the source and the receptor), no excess ground attenuation is assumed because the sound wave is reflected without energy losses. For acoustically absorptive or “soft” sites (i.e., sites with an absorptive ground surface, such as soft dirt, grass, or scattered bushes and trees), an excess ground attenuation value of 1.5 dBA per doubling of distance is normally assumed. When added to the geometric spreading, the excess ground attenuation results in an overall drop-off rate of 4.5 dBA per doubling of

Table 4.11-2. Airborne Sound Propagation Factors

	distance for a line source and 7.5 dBA per doubling of distance for a point source. Although some ground attenuation is expected, it is difficult to characterize accurately and is often ignored in a noise analysis to ensure a conservative analysis.
Atmospheric Effects	Research by the California Department of Transportation (Caltrans) and others has shown that atmospheric conditions can have a major effect on noise levels. Wind has been shown to be the single most important meteorological factor within approximately 500 feet, whereas vertical air temperature gradients are more important over longer distances. Other factors, such as air temperature, humidity, and turbulence, also have major effects. Receptors located downwind from a source can be exposed to increased noise levels relative to calm conditions, whereas locations upwind can have lower noise levels. Increased sound levels can also occur because of temperature inversion conditions (i.e., increasing temperature with elevation) which cause reflection of sound from the inversion layer back to the ground. As with ground absorption, atmospheric effects are often ignored in the interest of a conservative analysis.
Shielding by Natural or Human-made Features	A large object or barrier in the path between a noise source and a receptor can substantially attenuate noise levels at the receptor. The amount of attenuation provided by this shielding depends on the size of the object, proximity to the noise source and receptor, surface weight, solidity, and the frequency content of the noise source. Natural terrain features (such as hills and dense woods) and human-made features (such as buildings and walls) can substantially reduce noise levels. Walls are often constructed between a source and a receptor with the specific purpose of reducing noise. A barrier that breaks the line of sight between a source and a receptor would typically result in at least 5 dBA of noise reduction. A higher barrier may provide as much as 20 dBA of noise reduction. Lightly built barriers provide less attenuation.
Human Response to Noise	The dB scale alone does not adequately characterize how humans perceive noise. The dominant frequencies of a sound have a substantial effect on the human response to that sound. Although the intensity (energy per unit area) of the sound is a physical quantity, the loudness or human response is determined by characteristics of the human ear. Human hearing is limited in the range of audible frequencies, as well as in the way it perceives the sound pressure level in that range. In general, people are most sensitive to the frequency range of 1,000 to 8,000 Hertz (Hz) and perceive sounds within that range better than sounds of the same amplitude in higher or lower frequencies. To approximate the response of the human ear, sound levels in individual frequency bands are weighted based on the sensitivity of human hearing in those frequencies. The A-weighted sound level (expressed in units of dBA) can be computed using this information.

The A-weighting scale approximates the frequency response of the average young ear when listening to most ordinary sounds. When people make judgments regarding the relative loudness or annoyance of a sound, their judgments correlate well with the A-weighted sound levels of those sounds. Table 4.11-3 describes typical A-weighted sound levels for various noise sources.

Table 4.11-3. Typical Noise Levels in the Environment

Common Outdoor Noise Source	Noise Level	Common Indoor Noise Source
	120 dBA	
Jet fly-over at 1,000 feet		
	110 dBA	Rock concert
Pile driver at 100 feet	100 dBA	
		Night club with live music
	90 dBA	
Large truck passes by at 50 feet		
	80 dBA	Noisy restaurant
		Garbage disposal at 3 feet
Gas lawn mower at 100 feet	70 dBA	Vacuum cleaner at 10 feet
Commercial/Urban area daytime		Normal speech at 3 feet
Suburban expressway at 300 feet	60 dBA	
Suburban daytime		Active office environment
	50 dBA	
Urban area nighttime	40 dBA	Quiet office environment
Suburban nighttime		
	30 dBA	Library
Quiet rural areas		Quiet bedroom at night
	20 dBA	
Wilderness area		Quiet recording studio
	10 dBA	
Threshold of human hearing	0 dBA	Threshold of human hearing

Source: Caltrans 2013b (modified).
Acronyms: dBA = A-weighted decibels.

Studies show that under controlled conditions in an acoustics laboratory, a healthy human ear can discern changes in sound levels of 1 dBA. In a quiet environment with average background noise, the healthy human ear can detect changes of about 2 dBA. A change of 5 dBA is readily perceptible, and a change of 10 dBA is perceived as being twice as loud. Accordingly, a doubling of sound energy (e.g., doubling the volume of traffic on a highway) resulting in a 3-dB increase (which is perceived as approximately a 25 percent increase in noise level) in the normal environment would generally be barely detectable.

Underwater Sound Propagation

Underwater sound propagation is complex but is similar in certain respects to sound propagation through the air. Sound propagation in water is subject to the same governing propagation equations that apply in air. For construction activities in water, sound propagates through direct transmission from the source to the receiver, through reflected

paths from the surface and the bottom of the water medium, and there is the potential for sound energy to be re-radiated from the ground due to vibrations within the ground below the water depending on the construction activity. Normally, the ground-radiated noise is dominated by low frequencies, which cannot propagate efficiently through shallow water.

Noise and Health

Several studies have linked increases in noise with health effects, including hearing impairment, sleep disturbance, cardiovascular effects, psychophysiological effects, and potential impacts to fetal development (Babisch 2005). Potential health effects appear to be caused by both short- and long-term exposure to very loud noises and long-term exposure to lower levels of sound (chronic exposure). Acute exposure to sound levels greater than 120 dBA can cause mechanical damage to hair cells of the cochlea (the auditory portion of the inner ear) and hearing impairment (Babisch 2005). As noted in Table 4.11-3, sound levels between 110 dBA and 120 dBA are equivalent to a rock concert or a jet plane flying overhead at approximately 1,000 feet.

The World Health Organization (WHO) and the U.S. Environmental Protection Agency (USEPA) consider an equivalent noise level (Leq) of 70 dBA to be a safe daily average noise level for the ear. However, even this “ear-safe” level may cause disturbance to sleep and concentration and may be linked to chronic health impacts such as hypertension and heart disease (Babisch 2006). An analysis of 43 epidemiological studies of the association between noise exposure and blood pressure and ischemic heart disease (van Kempen et al. 2002) found no statistically significant correlation between community exposure and heart disease, although small but statistically significant correlations were found for occupational exposures. The study also found a positive correlation between high blood pressure and elevated noise exposure in the workplace. It was not, however, able to identify a threshold above which significant health effects could be expected to occur in the general population. The analysis concluded that “epidemiological evidence on noise exposure, blood pressure, and IHDs [ischemic heart diseases] is still limited” (van Kempen et al. 2002).

As such, there appears to be a relationship between exposure to higher than normal noise levels and some health effects, though the evidence is currently inconsistent. Recent research has not unequivocally identified community noise levels above which specific health effects may occur. In the absence of more definitive research, a sound level of 120 dBA may be a suitable threshold above which acute exposure would be health threatening. Similarly, chronic exposures above the 70-dBA threshold used by the WHO and USEPA may potentially be health threatening.

Groundborne Vibration Fundamentals

Ground vibration consists of rapidly fluctuating motions or waves with an average motion of zero. Several different methods are typically used to quantify vibration amplitude. One

is the Peak Particle Velocity (PPV) and another is the root-mean-square (RMS) velocity. The PPV is defined as the maximum instantaneous positive or negative peak of the vibration wave. The RMS velocity is defined as the average of the squared amplitude of the signal. The PPV is often used in monitoring construction and other peak events since it is related to the stresses that are experienced by buildings.

The two primary concerns with construction-induced vibration, the potential to damage a structure and the potential to interfere with the enjoyment of life, are evaluated against different vibration limits. Studies have shown that the threshold of perception for average persons is in the range of 0.008 to 0.012 inch/second PPV. Human perception to vibration varies with the individual and is a function of physical setting and the type of vibration. Persons exposed to elevated ambient vibration levels, such as people in an urban environment, may tolerate a higher vibration level.

In 1981 and as subsequently updated, the International Standards Organization (ISO) published the Guide to the Evaluation of Human Exposure to Vibration and Shock in Buildings (1 Hz to 80 Hz) (ISO 2631 [ISO 1997]). This document, based on the work of many researchers, suggested that humans are sensitive to particle velocity in the range of 8 to 80 Hz. This means that the same velocity at different discrete frequencies would elicit the same response, such as detection or discomfort. Below 8 Hz, the body is less sensitive to vibration, and therefore responds more uniformly to acceleration (i.e., higher velocities are needed to elicit the same response). Table 4.11-4 summarizes the vibration criteria in ISO 2631 for vibration sources with predominant frequencies in the range of 8 to 80 Hz. ISO 2631 recommends that one-third octave band filtering be used when the vibration source has many closely spaced frequencies or contains broadband energy.

Table 4.11-4. ISO 2631 Vibration Criteria

Building Use	Vibration Velocity Level (VdB)	Vibration Velocity RMS Amplitude (inch/second)
Workshop	90	0.032
Office	84	0.016
Residence	78 (day) / 75 (night)	0.008
Hospital Operating Room	72	0.004

Sources: Caltrans 2013c; ISO 1997.

Structural damage can be cosmetic (e.g., minor cracking of building elements) or may threaten the integrity of the building. Safe vibration limits that can be applied to assess the potential for damaging a structure vary by researcher and there is no consensus as to what amount of vibration may pose a threat for structural damage to the building. Construction-induced vibration that can be detrimental to the building is very rare and has only been observed in instances where the structure is at a high state of disrepair, and the construction activity occurs immediately adjacent to the structure.

Though PPV is appropriate for evaluating the potential of building damage, it has not been shown to be as suitable for evaluating human response. The human body has been shown to respond to the average vibration amplitude, as it takes some time for the human body to respond to vibration signals. Because the net average of a vibration signal is zero, the RMS amplitude is used to describe the "smoothed" vibration amplitude. The RMS of a signal is the square root of the average of the squared amplitude of the signal. The RMS amplitude is always less than the PPV and is always positive. The ratio of crest PPV to maximum RMS amplitude is defined as the factor for the signal. The crest factor is always greater than 1.71, although a crest factor of 8 or more is not unusual for impulsive signals. For groundborne vibration from trains, the crest factor is usually 4 to 5.

The reference velocity is 1×10^{-6} in/sec RMS, which equals 0 VdB, and 1 in/sec equals 120 VdB. Although not a universally accepted notation, the abbreviation "VdB" is used in this document for vibration decibels to reduce the potential for confusion with sound decibels. Typical background vibration levels are usually 50 VdB or lower, well below the threshold of perception for most humans. Perceptible vibration levels inside residences are attributed to the operation of heating and air conditioning systems, door slams, and foot traffic. Construction activities, train operations, and street traffic are some of the most common external sources of vibration that can be perceptible inside residences. Table 4.11-5 illustrates some common sources of vibration and the association to human perception or the potential for structural damage.

Groundborne noise is a secondary phenomenon of groundborne vibration. When a building or structure vibrates, noise radiates into the building's interior (e.g., rattling of windows, doors, or stacked dishes). Rattling sounds can generate vibration complaints, even with very little risk of actual structural damage. In high noise environments, which are more prevalent where groundborne vibration approaches perceptible levels, this rattling phenomenon may also be produced by loud airborne environmental noise that causes induced vibration in exterior doors and windows. Typically, this low-frequency sound would be perceived as a low rumble. The magnitude of the sound depends on the frequency characteristic of the vibration and the way the room surfaces in the building radiate sound. Groundborne noise is quantified by the A-weighted sound level inside the building. The sound level accompanying vibration is generally 25 to 40 dBA lower than the vibration velocity level. Groundborne vibration levels of 65 VdB can result in groundborne noise levels up to 40 dBA, which can disturb sleep. Groundborne vibration levels of 85 VdB can result in groundborne noise levels up to 60 dBA, which can be annoying to daytime noise sensitive land uses such as schools (U.S. Department of Transportation, Federal Transit Administration [FTA] 2006).

Table 4.11-5. Typical Levels of Groundborne Vibration

Human/Structural Response	Vibration Velocity Level (ref 1 µinch/second, RMS) *[PPV inches/second]*	Typical Events (50-foot setback)
Threshold, minor cosmetic damage fragile buildings	**100** [0.10]	Blasting, pile driving, vibratory compaction equipment
		Heavy tracked vehicles (Bulldozers, cranes, drill rigs)
Difficulty with tasks such as reading a video or computer screen	**90** [0.32]	
		Commuter rail, upper range
Residential annoyance, infrequent events	**80** [0.01]	Rapid transit, upper range
		Commuter rail, typical
Residential annoyance, frequent events		Bus or truck over bump or on rough roads
	70 [0.032]	Rapid transit, typical
Limit for vibration sensitive equipment (approximate human threshold of perception to vibration)		Buses, trucks and heavy street traffic
	60 [0.001]	
		Background vibration in residential settings in the absence of activity
	50 [0.00032]	

Source:FTA 2006 (modified).

Existing Onshore Noise in the Project Vicinity

The closest onshore noise sensitive uses to the Proposed Project site are within the jurisdiction of the MCBCP and in the coastal zone, and include San Onofre State Beach, various parks and outdoor use areas within MCBCP, and the San Clemente Municipal Golf Course. A noise monitoring survey was performed between Tuesday, September 27, 2016, and Wednesday, September 28, 2016, to document ambient noise conditions at locations representative of the noise environment at the perimeter of SONGS and nearby onshore noise sensitive areas. The noise monitoring survey included five attended short-term noise measurements (ST-1 through ST-5) and one unattended long-term noise measurement (LT-1). Noise measurement locations are shown on Figure 4.11-1. Short- and long-term results are presented in Table 4.11-6 and Figure 4.11-2.

Figure 4.11-1. Project Site and Noise Measurement Locations



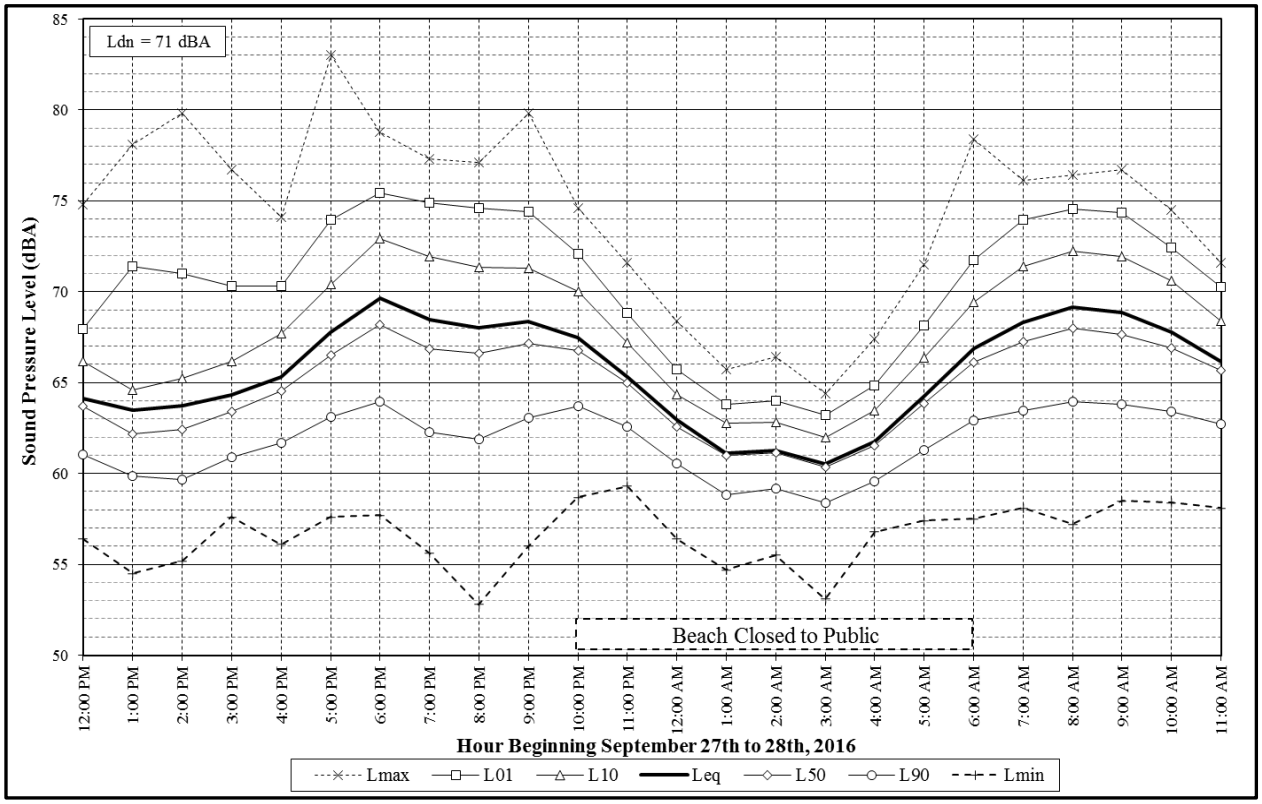
Source: Image from Google Earth 2017.

Table 4.11-6. Short-Term Noise Measurement Results (dBA)

Location	Date	Start Time	Duration (minutes)	Lmax	L_{01}	L_{10}	Leq	L_{50}	L_{90}	Lmin	Ldn (est.)
ST-1	9/27/16	1:20 p.m.	10	71	69	63	61	60	58	57	66
ST-1	9/28/16	9:50 a.m.	10	69	65	61	60	60	58	57	
ST-2	9/27/16	1:40 p.m.	10	62	58	54	52	51	49	48	60
ST-2	9/28/16	10:20 a.m.	10	69	65	56	55	53	51	49	
ST-3	9/27/16	2:20 p.m.	10	73	72	71	68	67	64	62	76
ST-3	9/28/16	11:40 a.m.	10	77	76	75	72	71	67	62	
ST-4	9/28/16	11:00 a.m.	20	56	55	53	52	51	50	49	56
ST-5	9/28/16	12:00 p.m.	20	69	69	67	63	62	58	57	65

Acronyms: Ldn = day/night noise level; Leq = equivalent noise level; Lmax = maximum sound level; L01, L10, L50, and L90 = A-weighted noise levels that are exceeded 1, 10, 50, and 90 percent of the time, respectively, during the measurement period.
Note: The L10 is typically considered the intrusive noise level, the L50 represents the median noise level, and the L90 represents, and is considered, the background, or ambient noise level.

Figure 4.11-2. Long-Term Noise Measurement Results



Three 10-minute duration short-term noise measurement locations (ST-1, ST-2, and ST-3) were used at the perimeter of SONGS to document existing ambient noise levels in the area, and two 20-minute duration short-term noise measurement locations (ST-4 and ST-5) were used at locations representative of the areas residential uses to the north and east of SONGS to document existing ambient noise levels in these areas. Two noise measurements were conducted, one in the morning and one in the afternoon.

- ST-1 (southwestern edge of parking area above SONGS site). The average measured sound levels ranged from 60 dBA Leq in the morning to 61 dBA Leq in the afternoon, with a calculated Ldn of 66 dBA.
- ST-2 (northwestern edge of parking area above SONGS site). The average measured sound levels ranged from 55 dBA Leq in the morning to 52 dBA Leq in the afternoon, with a calculated Ldn of 60 dBA.

Noise levels at both these measurement locations were dominated by traffic noise on Interstate (I-) 5 and Old Pacific Highway (Old Highway 101) to the east, largely varying on the relative exposure to traffic on these roadways.

- ST-3 (northwestern edge of seawall walkway at western edge of SONGS site). The average measured sound levels ranged from 72 dBA Leq in the morning to 68 dBA Leq in the afternoon, with a calculated Ldn of 76 dBA. Noise levels at this location were dominated by surf and wave noise.

Noise measurements at ST-4 and ST-5 were made in open space and residential areas near the southern edge of San Clemente, and between 1,400 and 1,800 feet east of I-5. Based on the proximity to I-5, the noise environment in this area is similar to the MCBCP housing closer to and above the site off Sand Piper Avenue and Cardinal Way. Average noise levels ranged from 52 to 63 dBA Leq, with calculated Ldn levels of between 56 and 65 dBA (see Table 4.11-6 above). Sources included local and I-5 traffic, helicopter overflights, and low-frequency sound from distant munitions testing at MCBCP.

The unattended long-term noise measurement (LT-1) was conducted in a tree near the southern edge of San Onofre State Beach from noon on Tuesday, September 27, 2016, to noon on Wednesday, September 28, 2016. Daytime temperatures during this period were in the mid to upper 80 degrees Fahrenheit (ºF) with light winds and no precipitation. Use of San Onofre State Beach by surfers and other recreationalists was high during the daytime portion of the measurement period. The primary source of environmental noise at the site was crashing waves and beach rock movements due to wave action. The hourly trends in noise levels measured at this location, including the energy equivalent noise level (Leq), maximum (Lmax), minimum (Lmin), and the noise levels exceeded 1, 10, 50, and 90 percent of the time (indicated as L_{01}, L_{10}, L_{50}, and L_{90}) are shown on Figure 4.11-2. Average noise levels ranged from 64 to 70 dBA Leq (day) and from 60 to 67 dBA Leq (night). Maximum noise levels also varied from 72 to 83 dBA (day) and 64 to 78 dBA (night). The calculated average Ldn at the long-term measurement site was 71 dBA.

4.11.2 Regulatory Setting

Relevant federal and state laws, regulations, and policies that pertain to the Proposed Project are summarized in Appendix A. The Marine Corps does not have specific plans or policies to limit noise exposure at noise sensitive land uses on its bases; per 13104.3 and 13104.4 of MCO P5090.2A Ch.3, 26-Aug-13, the Marine Corps seeks to comply with the procedural and substantive aspects of state and local environmental noise regulations. At the local level, the Noise Element of the San Diego County General Plan (San Diego County 2011) identifies policies to guide new project development exposure to or generation of noise. The policies below are applicable to the Proposed Project.

- **N-1.1: Noise Compatibility Guidelines.** Use the Noise Compatibility Guidelines and Noise Standards (Tables N-1 and N-2 [see Table 4.11-7]) as a guide in determining acceptability of exterior and interior noise for proposed land uses.
- **N-3.1: Groundborne Vibration.** Use the Federal Transit Administration and Federal Railroad Administration guidelines, where appropriate, to limit the extent of exposure that sensitive uses may have to groundborne vibration from trains, construction equipment, and other sources.

Table 4.11-8 describes in relevant part the San Diego County Code of Regulatory Ordinances sections related to noise.

Table 4.11-7. San Diego County Noise Compatibility Guidelines/Standards

Table N-1 Noise Compatibility Guidelines

Land Use Category		Exterior Noise Level (CNEL)						
			55	60	65	70	75	80
A	Residential—single family residences, mobile homes, senior housing, convalescent homes							
B	Residential—multi-family residences, mixed-use (commercial/residential)							
C	Transient lodging—motels, hotels, resorts							
D*	Schools, churches, hospitals, nursing homes, child care facilities							
E*	Passive recreational parks, nature preserves, contemplative spaces, cemeteries							
F*	Active parks, golf courses, athletic fields, outdoor spectator sports, water recreation							
G*	Office\professional, government, medical\dental, commercial, retail, laboratories							
H*	Industrial, manufacturing, utilities, agriculture, mining, stables, ranching, warehouse, maintenance/repair							

	ACCEPTABLE—Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal construction, without any special noise insulation requirements.
	CONDITIONALLY ACCEPTABLE—New construction or development should be undertaken only after a detailed noise analysis is conducted to determine if noise reduction measures are necessary to achieve acceptable levels for land use. Criteria for determining exterior and interior noise levels are listed in Table N-2, Noise Standards. If a project cannot mitigate noise to a level deemed Acceptable, the appropriate county decision-maker must determine that mitigation has been provided to the greatest extent practicable or that extraordinary circumstances exist.
	UNACCEPTABLE—New construction or development shall not be undertaken.

* Denotes facilities used for part of the day; therefore, an hourly standard would be used rather than CNEL (refer to Table N-2).

Table N-2 Noise Standards [Note]

1. The exterior noise level (as defined in Item 3) standard for Category A shall be 60 CNEL, and the interior noise level standard for indoor habitable rooms shall be 45 CNEL.
2. The exterior noise level standard for Categories B and C shall be 65 CNEL, and the interior noise level standard for indoor habitable rooms shall be 45 CNEL.
3. The exterior noise level standard for Categories D and G shall be 65 CNEL, and the interior noise level standard for indoor habitable rooms shall be 50 dBA L_{eq} (one-hour average).
4. For single-family detached dwelling units, "exterior noise level" is defined as the noise level measured at an outdoor living area which adjoins and is on the same lot as the dwelling, and which contains at least the following minimum net lot area: (i) for lots less than 4,000 square feet in area, the exterior area shall inlcude 400 square feet, (ii) for lots between 4,000 square feet to 10 acres in area, the exterior area shall include 10 percent of the lot area; (iii) for lots over 10 acreas in area, the exterior area shall include 1 acre.
5. For all other residential land uses, "exterior noise level" is defined as noise measured at exterior areas which are provided for private or group usable open space purposes. "Private Usable Open Space is defined as usable open space intended for use of occupants of one dwelling unit, normally

including yards, decks, and balconies. When the noise limit for Private Usable Open Space cannot be met, then a Group Usable Open Space that meets the exterior noise level standard shall be provided. "Group Usable Open Space" is defined as usable open space intended for common use by occupants of a development, either privately owned and maintained or dedicated to a public agency, normally including swimming pools, recreation courts, patios, open landscaped areas, and greenbelts with pedestrian walkways and equestrian and bicycle trails, but not including off-street parking and loading areas or driveways.
6. For non-residential noise sensitive land uses, exterior noise level is defined as noise measured at the exterior area provided for public use.
7. For noise sensitive land uses where people normally do not sleep at night, the exterior and interior noise standard may be measured using either CNEL or the one-hour average noise level determined at the loudest hour during the period when the facility is normally occupied.
8. The exterior noise standard does not apply for land uses where no exterior use area is proposed or necessary, such as a library.
9. For Categories E and F the exterior noise level standard shall not exceed the limit defined as "Acceptable" in Table N-1 or an equivalent one-hour noise standard.
Source: San Diego County 2011. Note: Exterior Noise Level combatibility guidelines for Land Use Categories A-H are identifed in Table N-1 Noise Compatibility Guidelines.

Table 4.11-8. San Diego County Code of Regulatory Ordinances – Noise

Ordinance	Noise Limit	Time Limit
§ 36.408 (Hours of Operation of Construction Equipment)	Not applicable	No operation from 7 p.m. to 7 a.m. and on Sunday or holiday[1]
§ 36.409 (Sound Level Limitations on Construction Equipment)	Average sound level of 75 decibels for an 8-hour period when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is being received	Between 7 a.m. and 7 p.m.
§ 36.410(a) (Sound Level Limitations on Impulsive Noise)	82 dBA (A-weighted decibels) in residential areas, measured at boundary line of property where noise source is located or any occupied property where the noise is received, for 25 percent of the minutes in the measurement period. Except for emergency work	Not applicable
§ 36.411 (Containers and Construction Material)	Disturbing, excessive, or offensive noise, which endangers health or safety or causes discomfort or annoyance to a person of normal sensitivity	Not applicable
§ 36.404 (General, Non-Construction Noise, most restrictive limit)[2]	50 dBA (1-hour average)	7 a.m. to 10 p.m.
	45 dBA (1-hour average)	10 p.m. to 7 a.m.

Source: San Diego County 2009.

Notes:

[1] January 1, last Monday in May, July 4, first Monday in September, December 25, and any day appointed by the President as a special national holiday or the Governor as a special State holiday."

[2] If the measured ambient noise level exceeds these limits, the allowable average 1-hour sound level is the 1-hour average ambient noise level plus 3 dB.

4.11.3 Significance Criteria

A noise impact is considered significant if noise levels from the Proposed Project exceed San Diego County noise and vibration criteria or significance criteria based on Appendix G of the State CEQA Guidelines. According to Appendix G of the State CEQA Guidelines, a significant impact would occur if the Project would:

- Expose persons to or generate noise levels that exceed a CNEL of 65 dBA at passive recreational areas or transient lodging or CNEL of 60 dBA at single family residential uses.
- Subject persons to excessive vibration levels. Groundborne vibration levels exceeding 0.2 inch/second PPV would have the potential to result in "architectural" damage to normal buildings and cause annoyance to persons.
- Expose persons to noise levels related to construction (demolition equipment or activities) in excess of the San Diego County noise ordinance.

4.11.4 Environmental Impact Analysis and Mitigation

This analysis considers potential noise impacts during implementation of the Proposed Project onshore and offshore. The analysis assesses the potential for significant Project-generated airborne noise levels in the Project vicinity or groundborne vibration levels that would cause significant annoyance to persons or cause architectural damage to buildings. Table 4.11-14 at the end of this section summarizes the Proposed Project's potential noise impacts to sensitive receptors (human) and any mitigation and Applicant-proposed measures (APMs) to reduce significant impacts to a less-than-significant level. Noise impacts to biological resources are addressed in Section 4.4, *Biological Resources*. Onshore noise would primarily result from the dismantlement of the onshore facility, while offshore and underwater noise would result from the dispositioning of offshore conduits.

ENVIRONMENTAL IMPACT ANALYSIS

Impacts of the proposed Project and recommended mitigation measures (MMs) are examined in this section.

Impact NOI-1: Expose Sensitive Receptors to Onshore Noise Levels in Excess of Standards.

Onshore Proposed Project activities could expose persons to noise levels exceeding standards established in the local General Plan or Noise Ordinance, or applicable standards of other agencies **(Less than Significant).**

Impact Discussion

Decontamination and dismantlement (D&D) work would result in locally elevated onshore noise levels. Noise from demolition activities at surrounding noise sensitive uses depends

on the type of construction equipment, timing and duration of noise generating activities, and distance between noise sources and noise sensitive receptors. Highest noise levels are expected during structural demolition and dismantlement, and site excavation, with lower noise levels occurring during material removal and site ~~reconstruction/restoration~~stabilization activities. Table 4.11-9 provides modeled maximum noise levels and use factors for construction equipment. Table 4.11-10 identifies the nearest onshore noise sensitive uses to the Major Project (MP) Areas requiring significant D&D activity.

Table 4.11-9. Construction Use Factors and Equipment Noise at 50 feet

Equipment Category	Use Factor (%)[2]	Lmax (dBA)[1]	Equipment Category	Use Factor (%)[2]	Lmax (dBA)[1]
Auger Drill Rig	20	85	Impact Pile Driver	20	95
Backhoe	40	80	Jackhammer	20	85
Bar Bender	20	80	Man Lift	20	85
Blasting	1	94	Mounted Impact Hammer	20	90
Boring Jack Power Unit	50	80	Pavement Scarafier	20	85
Chain Saw	20	85	Paver	50	85
Clam Shovel (dropping)	20	93	Pickup Truck	40	55
Compactor (ground)	20	80	Pneumatic Tools	50	85
Compressor (air)	40	80	Pumps	50	77
Concrete Batch Plant	15	83	Refrigerator Unit	100	82
Concrete Mixer Truck	40	85	Rivit Buster/chipping gun	20	85
Concrete Pump Truck	20	82	Rock Drill	20	85
Concrete Saw	20	90	Roller	20	85
Crane	16	85	Sand Blasting	20	85
Dozer	40	85	Scraper	40	85
Drill Rig Truck	20	84	Shears (on backhoe)	40	85
Drum Mixer	50	80	Slurry Plant	100	78
Dump Truck	40	84	Slurry Trenching Machine	50	82
Excavator	40	85	Soil Mix Drill Rig	50	80
Flat Bed Truck	40	84	Tractor	40	84
Front End Loader	40	80	Vacuum Excavator	40	85
Generator	50	82	Vacuum Street Sweeper	10	80
Generator (<25 KVA)	50	70	Ventilation Fan	100	85
Gradall	40	85	Vibrating Hopper	50	85
Grader	40	85	Vibratory Concrete Mixer	20	80
Grapple (on backhoe)	40	85	Vibratory Pile Driver	20	95
Horizontal Boring Jack	25	80	Warning Horn	5	85
Hydra Break Ram	10	90	Welder / Torch	40	73

Source: Federal Highway Administration (FHWA) 2006.
Acronyms: dBA = A-weighted decibels; KVA = kilovolt-ampere.
Notes:
[1] Noise levels in Table 4.11-9 were calculated using the Roadway Construction Noise Model (RCNM v.1.1). Levels were measured at 50 feet from the construction equipment, with a “slow” (1 second) time constant.
[2] Noise levels apply to total noise emitted from equipment and associated components operating at full power while engaged in its intended operation.

Table 4.11-10.Closest Onshore Noise Sensitive Uses to D&D Activities

Sensitive Use Area	Representative Ambient Noise Measurement	Nearest MP Area requiring Significant D&D	Distance to Periphery of Nearest MP Area
North edge of northwestern edge of seawall walkway (recreational users)	ST-3	Turbine Building Area (TBA)	900 feet
South end of State Surf Beach (recreational users)	LT-1	Turbine Building Area (TBA)	1,900 feet
Closest residential uses on Marine Corps Base Camp Pendleton	ST-4 & ST-5	Unit 2 Area (U2A)	6,400 feet

Acronyms: D&D = decontamination and dismantlement; MP Area = Major Project Area.

A conservative analysis of worst-case noise levels from D&D activities at these closest sensitive onshore receptors was conducted (see Appendix ~~J~~H). For this analysis, all major noise producing equipment expected to be used were modeled at the periphery of the closest MP Area to the identified sensitive receptors, and only sound attenuation due to distance was considered, with no additional attenuation due to intervening terrain. The output of the Roadway Construction Noise Model v.1.1 (see Table 4.11-9) provides the overall Lmax and Leq levels from each of the equipment types considered and the Lmax and Leq levels from the combined D&D activities, as shown in Table 4.11-11.

Table 4.11-11.D&D Noise Levels at the Closest Onshore Noise Sensitive Uses

Equipment Types	Equipment Sound Levels at Receivers (dBA)					
	Recreational users				MCBCP Residences	
	Seawall walkway		State Surf Beach			
	Lmax	Leq	Lmax	Leq	Lmax	Leq
Clam Shovel (dropping)	62	55	56	49	45	38
Compressor (air)	53	49	46	42	36	32
Concrete Saw	65	58	58	51	47	40
Crane	55	48	49	41	38	30
Dozer	57	53	50	46	40	36
Dump Truck	51	47	45	41	34	30
Excavator	56	52	49	45	39	35
Front End Loader	54	50	48	44	37	33
Grapple (on backhoe)	62	58	55	51	45	41
Jackhammer	64	56	57	50	47	40
Hydra Break Ram	65	55	58	48	48	38
Mounted Impact Hammer	65	58	59	52	48	41
Pneumatic Tools	60	57	54	51	43	40
Rivet Buster/chipping gun	54	47	48	41	37	30
Shears (on backhoe)	71	67	65	61	54	50
Vacuum Excavator	60	56	54	50	43	39
Welder/Torch	49	45	42	38	32	28
Warning Horn	58	45	52	39	41	28
Level with All Equipment Operating	**71**	**70**	**65**	**63**	**54**	**53**

Source: FHWA 2006. See Appendix H.

The results of this analysis indicate that the average and maximum sound levels from worst case D&D operations would be 70 dBA and 71 dBA at the northern edge of northwestern edge of the seawall walkway, 63 dBA to 65 dBA at the southern end of the State Surf Beach, and 53 dBA and 54 dBA at the closest MCBCP residential uses. These levels would not exceed the San Diego County Noise Ordinance or General Plan Noise Element limits resulting in a less-than-significant impact. Noise levels at these areas would be lower if worst case operational conditions occur further from the MP Areas periphery or if less equipment is used simultaneously.

Mitigation Measures

No MMs are recommended for Impact NOI-1.

Impact NOI-2: Expose Sensitive Receptors to Excessive Groundborne Vibration or Groundborne Noise.

Equipment used for the Proposed Project could generate substantial vibration, which may expose sensitive receptors or vibration-sensitive equipment to excessive groundborne vibration or noise levels **(Less than Significant).**

Impact Discussion

Decommissioning activities such as the use of jackhammers, and other high-power or vibratory tools, and rolling stock equipment may generate substantial vibration in the immediate vicinity of the work area. Vibration levels would vary depending on soil conditions, construction methods, and equipment used. Table 4.11-12 presents typical vibration levels that could be expected from construction equipment at a distance of 25 feet. However, given the large distances (900 or more feet) between MP Areas and sensitive use locations, groundborne vibration levels at these locations even from pile driving activities would be below 0.006 inch/second and are expected to be well below perceptible levels. Therefore, this impact would be less than significant.

Table 4.11-12. Vibration Source Levels for Construction Equipment

Equipment		PPV at 25 feet (inches/second)
Pile Driver (Impact)	Upper range	1.158
	Typical	0.644
Pile Driver (Sonic)	Upper range	0.734
	Typical	0.170
Clam Shovel Drop		0.202
Mounted Impact Hammer		0.089
Large Bulldozer		0.089
Loaded Trucks		0.076
Jackhammer		0.035
Small Bulldozer		0.003

Source: FTA 2006.

With respect to potential vibration impacts on the Approved ISFSI due to Proposed Project activities, the canisters stored in the Approved ISFSI are designed not only for long-term storage in the facility, but also can be placed directly into transportation casks for eventual off-site storage or disposal. As a result, the canisters are designed (in combination with transportation casks) to withstand the routine vibration impacts of rail and/or truck transportation, as well as high energy impacts associated with potential accident scenarios. The Approved ISFSI is also designed and licensed to withstand all of SONGS Site-Specific External Hazards, including natural and human caused scenarios that would cause substantial shaking, mechanical stresses, and vibration of the canisters. For example, the design for the Approved ISFSI considered earthquakes, which would likely be substantially more destructive than the shaking and/or vibration associated with Proposed Project activities and operations.

Mitigation Measures

No MMs are recommended for Impact NOI-2.

Impact NOI-3: Substantial Temporary or Periodic Increase in Ambient Noise Levels at Sensitive Receptors.

The Proposed Project could result in substantial temporary or periodic increase in ambient noise levels at the closest noise sensitive use areas **(Less than Significant).**

Impact Discussion

As discussed above under Impact NOI-1, the Proposed Project could expose persons to average and maximum sound levels of 70 to 71 dBA at the northern edge of northwestern edge of the seawall walkway, 63 to 65 dBA at the southern end of State Surf Beach, and 53 to 54 dBA at the closest residential uses on MCBCP. Based on a review of noise measurement data representing ambient noise conditions in these areas, as discussed in this section, such noise levels would not exceed current ambient conditions at these closest noise sensitive use areas. Therefore, this impact would be less than significant.

Mitigation Measures

No MMs are recommended for Impact NOI-3.

Impact NOI-4: Create Excessive Underwater Noise.

Offshore Proposed Project activities could expose sensitive receptors (humans) to excessive offshore noise levels **(Less than Significant).**

Impact Discussion

The Proposed Project would require removal of the manhole access port structures, primary offshore intake structure, auxiliary offshore intake structure, and approximately 12 diffuser ports. The preferred means of removal of the various structures includes excavation or dredging of the surrounding seabed to gain access to the structures, and then using a diamond wire cutter to saw through the structures to remove them from the large conduits, which would be left in place. Underwater noise impacts from the saw cutting and removal of the various components, would be within 33 feet of the activities being conducted. The primary noise generation would be from the operation of the crew boats, tug boats, dredging operation, and underwater cutting of concrete. As a result, temporary increases in underwater noise levels caused by Project-related construction (e.g., saw cutting and dredging) and vessel traffic (e.g., crew and tug boats) may potentially expose sensitive receptors to excessive noise levels.

There are limited data for saw cutting. Hydroacoustic data were collected and reviewed from three sources: (1) Naval Base Point Loma, San Diego Fuel Pier Replacement Project October 8, 2014, to April 30, 2015 (Naval Facilities Engineering Command [NAVFAC] Southwest [SW] 2015); (2) Philadelphia Naval Shipyard September 30 through October 2, 2014 (Illingworth & Rodkin, Inc. 2014); and (3) a study reporting underwater sound measurement data during saw cutting of 2.5-foot-diameter conductors at a North Sea oil and gas platform (Pangerc et al. 2017). [50] For the Naval Base Point Loma project, a diamond wire saw was used to cut 72-inch-diameter caissons underwater near the mud line. The caissons were composed of a rusted steel outer layer with a concrete, wood, and steel cable interior. Underwater sound measurements were made at half of the water depth and approximately 50 feet from the activity. The duration of saw cutting was approximately 4 hours per cut (the same duration assumed for the Proposed Project) and the acoustics were collected intermittently as the diamond wire saw passed through different layers of the caisson. Two metrics were analyzed: peak[51] and 90 percent RMS[52] sound pressure levels.

Crew and tug boat noise would be limited to short durations, typically while transporting the crews and equipment. For this analysis, the total duration of both types of vessels operating daily is assumed to be less than 2 hours per day. Also, these vessels are assumed to be considered non-impulsive continuous noise sources. Vessel noise is a combination of narrowband tones at specific frequencies and broadband noise, which are

[50] Data from the Philadelphia Naval Shipyard were for cutting a concrete dock above water, and data measured from the North Sea Project were at distances between 330 to 2,600 feet from the saw cutting source, so neither of these projects is similar to the Proposed Project and are not discussed further.

[51] Peak sound pressure level based on the largest absolute value of the instantaneous sound pressure. This pressure is expressed in this report as a decibel (referenced to a pressure of 1 µPa) but can also be expressed in units of pressure, such as µPa or PSI (pound per square inch).

[52] RMS sound pressure level is the average of the squared pressures over the time that comprise that portion of the waveform containing 90 percent of the sound energy for a given time interval.

roughly related to a vessels' size and speed. For vessels, the approximate size of crew and supply boats that would be used from the Proposed Project, tones dominate up to about 50 Hz. Broadband components may extend up to 100 kHz, but they peak much lower, at between 50 and 150 Hz. Richardson et al. (1995) summarized noise from various vessels, providing estimated source levels of 156 dB (RMS; underwater) for a 53-foot-long crew boat (with a 90-Hz dominant tone) measured at 52 feet and 159 dB (RMS; underwater) for a 112-foot-long twin diesel (630 Hz, 1/3 octave) measured at 112 feet.

Table 4.11-13, which summarizes underwater thresholds for human diver safety based on three different studies summarized in a 2008 TNO report (Aimslic 2008), presents noise thresholds identified for unprotected recreational divers.

Table 4.11-13.Noise Thresholds for Recreational Divers

Source	Frequency Range (Hz)	Maximum Value (dB re 1 µPa)
NATO Undersea Research Center	600 to 2,500	154 (RMS)
Diving Medical Advisory Committee	Unspecified, believed to be 1,500	201 (Peak)
Parvin	500 to 2,500	155 (RMS)

Source: Aimslic 2008.
Acronyms: dB re 1 µPa = decibels referenced to 1 micropascal; Hz = hertz; RMS = root mean square.

Studies have shown that high levels of underwater noise can cause dizziness, hearing damage, or other sensitive organ damage to divers and swimmers, and may elicit startle responses. Based on the studies summarized above, which consider different noise sources (that may not be directly transferable to the Proposed Project), underwater noise levels in excess of 154 dB re 1 µPa could be considered potentially harmful to recreational divers and swimmers in the Proposed Project area. Noise levels from saw cutting ranged from 150.1 dB to 159.2 dB (peak; underwater) and 145.6 dB to 155.4 dB (90 percent RMS; underwater), depending on the metric used, at 50 feet. In addition, noise levels from vessels would be 156 dB (RMS; underwater) for a 53-foot-long crew boat at 52 feet and 159 dB (RMS; underwater) for a 112-foot-long twin diesel at 112 feet. As such, these noise levels would only exceed the thresholds in Table 4.11-13 in the immediate vicinity of saw cutting and the vessels. Divers, swimmers, and surfers would not be allowed in the immediate vicinity of Proposed Project work due to implementation of safety protocols, such as placement of barriers/flags/buoys to maintain a clear work area, required notification via the U.S. Coast Guard Local Notice to Mariners, and because the offshore work would be reasonably far away from swimming/beach locations. As such, impacts would be less than significant.

Mitigation Measures

No MMs are recommended for Impact NOI-4.

4.11.5 Cumulative Impacts

With regard to noise, cumulative impacts are associated with site-specific noise of the Proposed Project combining with site-specific noise of cumulative projects. Ground vibrations dissipate more rapidly than noise levels, limiting the geographic extent of ground vibration cumulative impacts to the immediate vicinity of the vibration source. As discussed in Section 3.2, *Relevant Cumulative Projects*, and shown in Table 3-2, 10 reasonably foreseeable cumulative projects fall within the geographic area near SONGS considered for potential cumulative impacts related to noise.

The potential for cumulative construction noise would be greatest at any sensitive receptors located near two or more work sites. Three cumulative projects are located within the existing SONGS facility (ID Nos. 1, 2, and 5 in Table 3-2). Of these three projects, the Holtec facility portion of the Approved ISFSI ~~Expansion~~ and SONGS Riprap and Public Access Walkway Repairs have been completed. Work associated with Cumulative Projects ID No. 2 (SONGS Mesa Environmental Investigation and Remediation) includes preparing and implementing a health risk assessment and remediation plan for Mesa Parcels 6 and 7 before issuance of a No Further Action letter by DTSC (SCE 2018b – DR #5-2). The anticipated date to return the property to the DoN is June 2021 (SCE 2018b – DR #5-2). As the remediation plan for Parcels 6 and 7 has not yet been prepared and activities are expected to occur over several years, it would be speculative to assess the associated cumulative impacts.

Cumulative Projects ID No 44 (see Table 3-2) includes the proposed San Onofre to Pulgas Double Track component, which involves the replacement of two rail bridges, 5.8 miles of second mainline rail track, an addition of a universal track crossover, and new signaling. This project would include use of heavy equipment during construction, which is expected to generate temporary noise levels like those shown in Table 4.11-9. Noise sensitive receptors that could be affected include recreational users along the seawall walkway and recreational users at State Surf Beach. Given the long duration of the Proposed Project, temporary noise during construction of the Proposed Project and the San Onofre to Pulgas Double Track could potentially occur simultaneously.

Given the predicted noise levels of the Proposed Project at the closest noise sensitive uses (see Table 4.11-11), should construction occur simultaneously, noise levels at these receptor locations are not expected to exceed 75 dB for an 8-hour period (Leq) when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is being received. Therefore, construction noise from the Proposed Project would comply with San Diego County Code of Regulatory Ordinances Section 36.409 (Construction Equipment) and would not have a significant cumulative contribution to temporary noise increases over ambient conditions.

4.11.6 Future Activities

SONGS Decommissioning Future Activities include retention, removal, or relocation of the Approved ISFSI facility (based on other agency permit requirements), eventual dismantling of the Approved ISFSI facility, and site restoration activities needed for final NRC license termination and to meet federal landowner requirements. None of these activities would result in substantial permanent noise sources, but instead temporary construction-type land-based noise and vibration levels similar to those discussed in Impacts NOI-1 through NOI-3 for the Proposed Project. As such, temporary noise levels are not anticipated to exceed the San Diego County Noise Ordinance or General Plan Noise Element limits (based on existing noise performance levels presented in these documents). Furthermore, such noise levels would not exceed current ambient conditions at these closest noise sensitive use areas. While SONGS Decommissioning Future Activities are proposed beginning in year 2035, no conditions are currently known that may significantly alter ambient noise conditions of the area. Finally, any temporary vibration generated during SONGS Decommissioning Future Activities would attenuate to well below perceptible levels at adjacent sensitive receptor locations given their distance from the proposed work areas. Therefore, noise and vibration impacts from onshore SONGS Decommissioning Future Activities are anticipated to be less than significant.

Future Activities offshore would include removal of the solid covers over the mammal exclusion barriers on the Unit 2 discharge conduit, and if required by the Commission, removal of the remaining discharge conduit diffuser ports. These removal activities would be short-term, limited in scope, and would not be expected to create excessive underwater noise, similar to the Proposed Project.

4.11.7 Summary of Proposed Mitigation Measures

Table 4.11-14 provides a summary of the mitigation and Applicant-proposed measures.

Table 4.11-14.Noise Impact/Mitigation Summary

Impact	MM/APM
NOI-1: Expose Sensitive Receptors to Onshore Noise Levels in Excess of Standards	None recommended
NOI-2: Expose Sensitive Receptors to Excessive Groundborne Vibration or Groundborne Noise	None recommended
NOI-3: Substantial Temporary or Periodic Increase in Ambient Noise Levels at Sensitive Receptors	None recommended
NOI-4: Create Excessive Underwater Noise	None recommended

4.12 RECREATION AND PUBLIC ACCESS

This section describes existing recreational facilities and activities in the Proposed Project vicinity, including public access to coastal resources and opportunities, identifies applicable significance thresholds, assesses the Proposed Project's impacts to recreation and access and their significance, and recommends measures to avoid or substantially reduce any effects found to be potentially significant.

4.12.1 Environmental Setting

The U.S. Department of Navy (DoN)-owned land where onshore decommissioning would occur (DoN Property) covers approximately 99 acres: an 84-acre easement for the San Onofre Nuclear Generating Station (SONGS); two adjacent leased parcels, including parking lots and laydown/storage land comprising approximately 15 acres; and easements for an access road and rail spur. This site is within Marine Corps Base Camp Pendleton (MCBCP or Base), which is bordered by about 17 miles of coastline. All on-site decommissioning activities would occur within the DoN Property and on California State Lands Commission (CSLC) Lease PRC 6785.1 offshore. The offshore study area extends westward approximately 8,900 feet (1.7 miles) from the SONGS site to account for the 8,400-foot-long Unit 2 discharge conduit plus a buffer area of 500 feet.

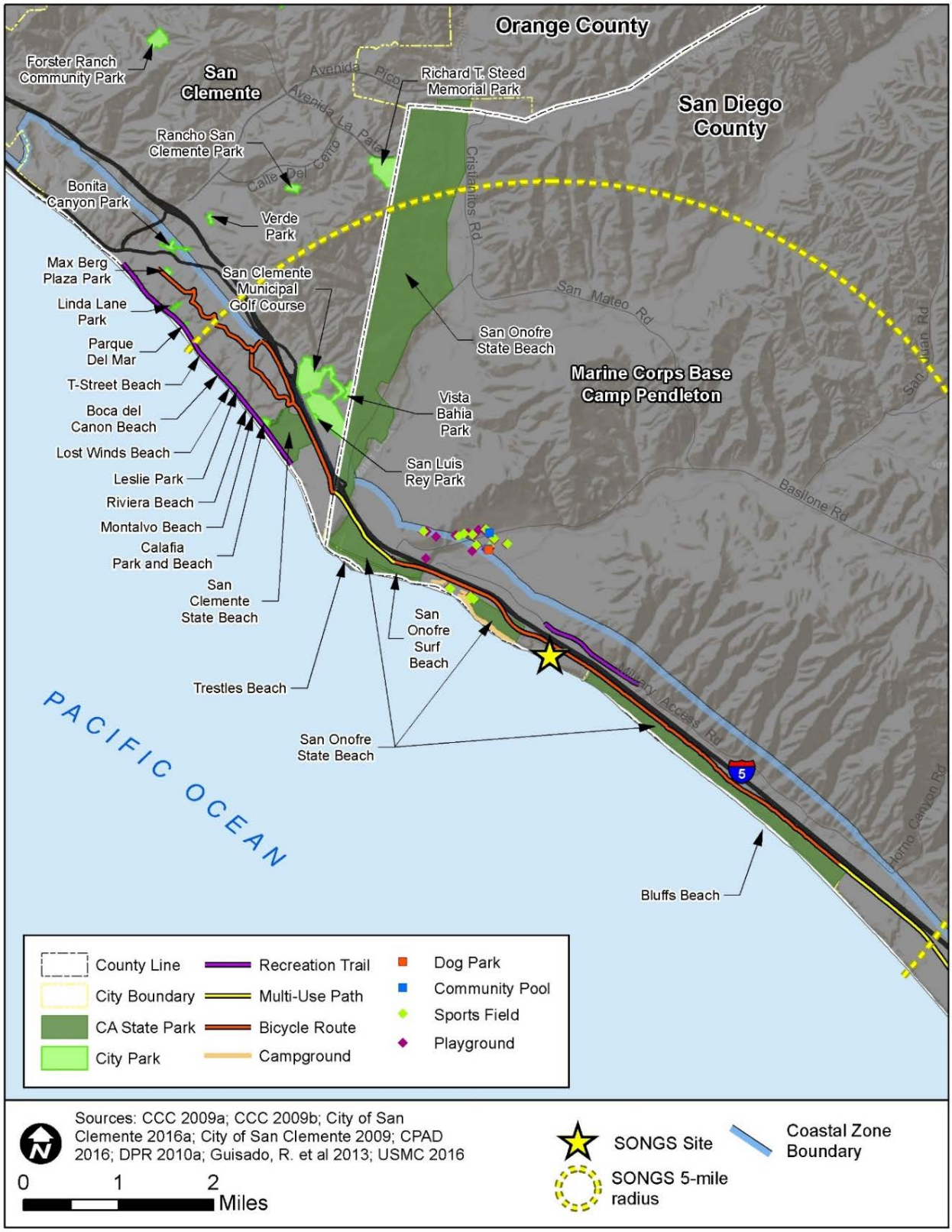
As with the land use and planning analysis, the study area for recreation and public access covers facilities within a 5-mile radius of SONGS, which includes the area within and offshore MCBCP as well as San Onofre State Beach and the city of San Clemente (see Figure 4.12-1). In addition, portions of the 5-mile study area fall within the coastal zone (California Coastal Commission [CCC] 2009a). A 5-mile radius was selected because all short- and long-term direct and indirect impacts associated with land use are reasonably expected to occur within this area or closer to the Proposed Project site. The SONGS shoreline and offshore facilities within MCBCP include a lateral (parallel to shore) public access walkway seaward of the seawall constructed for Units 2 and 3. Cleveland National Forest borders MCBCP's north/northwest side, but does not fall within 5 miles of the Proposed Project site, as shown in Figure 4.12-1. The following sections describe the recreational resources and public access associated with each of the above-referenced jurisdictions located within the study area.

4.12.1.1 Marine Corps Base Camp Pendleton

For base and military personnel, MCBCP provides recreational facilities associated with cantonment areas[53] and activities such as bicycling, camping, fishing, hiking, horseback riding, hunting, jogging, picnicking, and beach access (MCBCP 2012).

[53] Developed areas of the Base are referred to as cantonment areas. Cantonment areas located within the study area include San Mateo, San Onofre, School of Infantry, and Horno (USMC 2009).

Figure 4.12-1. Recreational Resources within 5 Miles of the Proposed Project



Cantonment areas in the study area contain swimming pools, recreational centers, community centers, youth centers, concession shops and restaurants, racquetball courts, a theater, and a gymnasium/activity building (USMC 2009). A coastal recreation area with campgrounds and cottages in the San Onofre Cantonment, 1 mile north/northwest of SONGS next to Old Pacific Highway (Old Highway 101), is used by active duty and retired military, their dependents, base personnel, and guests (USMC 2009).

The study area also includes training areas where recreational hunting is allowed year-round when not in use for military exercises. Hunting is allowed before or after working hours (7:30 a.m. and 4:00 p.m.) and all day on holidays and weekends, as authorized (MCBCP 2012). In addition, MCBCP's Fish Program includes opportunities that range from surf fishing and clamming on authorized beaches to freshwater fishing at a variety of inland locations. Public clamming with a license is allowed at San Onofre State Beach; however, no inland freshwater fishing is publicly available.

Public access to MCBCP is generally restricted for safety and security reasons, although civilians are permitted to access concession shops and restaurants, attend concerts, visit museums (by appointment), participate in outdoor races (biking, runs, and marathons), bicycle along Old Pacific Highway, and use the lateral public access walkway seaward of SONGS. The public also has access to San Onofre State Beach, as further described below under *San Onofre State Beach*.

As part of its regulatory approval process for the building and use of Units 2 and 3, the CCC required construction and maintenance of the lateral public access walkway under SONG's 1982 amendment to Coastal Development Permit (CDP) No. 6-81-330-A (CCC 2016b). The public access walkway is approximately 1,954 feet long and 15 feet wide for most of its length (a small section at its northwest end is approximately 30 feet in width). The public access walkway provides connectivity between those two portions of San Onofre State Beach that flank either side of the Proposed Project site (the San Onofre Bluffs and Beach and Surf Beach) (California Department of Parks and Recreation [DPR] 2010a). A CDP waiver was approved by the CCC in March 2018 to move and elevate shoreline riprap to provide for better walkway support (see Table 3-1 and Figure 3.1-2, ID No. 6).

In addition to the above, the SONGS shoreline and onshore facilities are open to public commercial fishing and recreational boating when not in use for military operations (EDAW 2010). According to a subsea video and photographic transect survey conducted on October 28, 2016, commercial fishing for California spiny lobster (*Panulirus interruptus*) occurs along the corridors of the Unit 2 and 3 diffuser ports (lobster traps were observed immediately adjacent to the ports along three of the transects taken) (MBC Applied Environmental Sciences 2017a). Please see *Offshore Recreation*, below, for additional information regarding ocean access.

4.12.1.2 San Onofre State Beach

San Onofre State Beach is 3,036 acres in size and leased to the DPR by the DoN. It is made up of four subunits, as summarized in Table 4.12-1.

Table 4.12-1. Summary of San Onofre State Beach Subunits

Subunit	Facilities and Features	Allowable Use Intensity[1]
Subunit 1: Cristianitos Creek	• 2,500 acres • San Mateo Campground • Cristianitos Creek • Parking • Agricultural Preserve	• Light (birdwatching, hiking, nature study, painting [artistic], photography, scenic observation) • Medium (bicycling, fishing, picnicking, sunbathing, surfing) • High (camping, parking, picnicking, roads [paved]) • Agricultural Intensity Use
Subunit 2: San Mateo Creek/ Trestles	• 6,000 linear feet of coastline • San Mateo Point • Trestles Wetland Natural Preserve • Trestles Beach • Lifeguard Headquarters • San Mateo and San Onofre Creeks	• Light • High
Subunit 3: Surfer Beach	• 3,400 linear feet of coastline • Surf Beach • Parking • Old Pacific Highway • North/northwest of SONGS	• Light • High
Subunit 4: San Onofre Bluffs	• 3.5 miles of coastline • San Onofre Bluffs Campground • Bluffs Beach • Parking • Old Pacific Highway • South/southeast of SONGS	• Light • High

Source: DPR 2010a, 1984.
Notes: [1] Allowable Use Intensities are defined in San Onofre State Beach General Development Plan Amendment, Resource Element, Table 1 (Limiting Factors and Allowable Use of Sensitive Areas).

San Onofre State Beach has almost 2.5 million visitors per year and ranks as one of California's five most-visited state parks (DPR 2017b). Overnight facilities include family/individual and group campsites, primitive (undeveloped) campsites, and recreational vehicle (RV) sites. Additional facilities include parking areas, restrooms, showers, electrical hook-ups, potable water, and fire pits (DPR 2017b). Day-use activities include bike trails, hiking trails, picnic areas, fishing, interpretive exhibits, scuba diving/snorkeling, swimming, surfing, kayaking, windsurfing, nature and wildlife viewing, and geocaching (DPR 2017b). Day use hours are year-round from 6:00 a.m. to 10:00 p.m. (DPR 2009). Both day use and over-night camping require fees and permits.

The San Onofre Bluffs and Campground is open for both camping and day use and six trails connect it to the beach below. The campground includes 175 group, individual, and RV campsites. It is closed to camping from October 1 through April 14 and only available for day use during this period (DPR 2010b; Tobin 2016). The campground's maximum capacity is 1,450 people, and its peak use is from June through September. During the off-peak season, its average use is 50 percent of its peak use, or 725 people (Tobin 2016). During the peak season, campers are restricted to 7 nights of use, and during the off-peak season (the second half of April and May), campers are restricted to 2 weeks of use. Upon leaving the campground, campers are prohibited from re-entering for 30 days (Tobin 2016).

The San Mateo Campground is located at 830 Cristianitos Road and includes 157 group, individual, and RV campsites that can each accommodate up to eight people (DPR 2009). The campground is open year-round and has a maximum capacity of 1,370 people (Tobin 2016). Its peak use is from June through September; during the off-peak season, its average use is 50 percent of its peak use, or 685 people (Tobin 2016). During the peak season, campers are restricted to 7 nights of use, and during the off-peak season, campers are restricted to 2 weeks of use. Upon leaving the campground, campers are prohibited from re-entering for 30 days (Tobin 2016).

Trestles Beach is considered a premier surfing break and is not accessible by car (DPR 2017b). No use fee is required. Surfers distinguish between several sub-areas of the beach, including "Lower," "Middle(s)," "Upper(s)," "Cotton," and "Churches," with characteristic wave types that call for varying board lengths and skills (CCC 2009b; Guisado et al. 2013). Trestles is considered to produce some of the best and most consistent surf in the region all year round, and its use is categorized as being "Crowded" (Guisado et al. 2013). The location of Trestles Beach is shown in Figure 4.12-1, above.

San Onofre Beach can be reached from the DPR's San Onofre Beach access road. A DPR day pass fee is required and parking is available along an unpaved parking area (CCC 2009b; Guisado et al. 2013). During daylight savings time the gates are open from 6:00 a.m. to 10:00 p.m., and during non-daylight savings time the gates are open from 6:00 a.m. to 8:00 p.m. Locally referred to as "San O," the beach is made up of "The Point," "Old Man's," and "Dogpatch," which can be surfed by all skill levels. The beach is used most in the summer, and is categorized as being "Crowded" (Guisado et al. 2013).

Annual (2017) recreation events at or near San Onofre State Beach included the: Hurley Pro Am at Trestles Beach (September 2017); Surfing America 2017 USA Surfing Championships at Lower Trestles Beach (June 2017); Iron Man Triathlon (April 1, 2017), and Bike MS: Bay to Bay Cycling Event (October 2017) (DPR 2017a).

The MCBCP recreational beach, which is not open to the public, is located up-coast (north) of San Onofre Surf Beach (CCC 2009b), see Figure 4.12-1, above. Bluffs Beach,

also known as Trails Beach, can be accessed via the San Onofre Bluffs and Campground, and a DPR day pass fee is required. The beach is open year-round, and is appropriate for all surf skill levels. Due to its day fee and the steep hike necessary to access the beach, its use is lower than the use associated with Trestles and San Onofre Surf Beaches (Wavecation.com 2017).

4.12.1.3 City of San Clemente

Public recreation facilities within the southern-most portion of the City are summarized in Table 4.12-2.

Table 4.12-2. City of San Clemente Public Recreational Facilities

Facility Name	Distance and Proximity to Proposed Project Site[1]	Facility Type
San Clemente Beach Trail	3.9 to 5 miles west/northwest	City Pedestrian Trail
Avenida Valencia and South Ola Vista Class III Bike Routes	4.6 to 5 miles west/northwest	City On-road Shared-lane Signed Bike Route
South Ola Vista and Del Presidente Class II Bike Lanes	2.9 to 4.6 miles west/northwest	City On-road Striped Bike Lane
San Clemente State Beach	3.7 miles west/northwest	State Beach
San Clemente Municipal Golf Course	3.25 miles west/northwest	City Golf Course
San Luis Rey Park	3.6 miles west/northwest	City Park
Calafia Park	3.9 miles west/northwest	City Park
Vista Bahia Park/Waterman Little League Field	3.8 miles west/northwest	City Park
Leslie Park	4.4 miles west/northwest	City Park
Parque Del Mar	5 miles west/northwest	City Park
San Clemente City Beach	3.9 to 5 miles west/northwest	City Beach

Sources: City of San Clemente 2009; Google Earth 2016.
Notes: [1] Within 5 miles of Proposed Project. Mileage is approximate and does not account for topographic variation.

As indicated in Table 4.12-2, the southern portion of the City offers a wide range of recreational facilities and opportunities, including neighborhood parks, a municipal golf course, and coastal and inland networks of hiking trails and bike routes. The City additionally includes over 4.5 miles of coastline. Its beaches vary by width of sand, on-site or adjacent amenities, and surf breaks, thereby creating opportunities for a wide range of beach activities from passive recreation to active athletic competitions (City of San Clemente 2016a). Beaches under the City's jurisdiction are made up of 2 miles of coastline, or approximately 20 acres (City of San Clemente 2016b). Within the 5-mile study area, these beaches include, from north to south, T-Street, Boca del Canon, Lost Winds, Riviera, Montalvo, and Calafia, as shown in Figure 4.12-1.

T-Street Beach, which flanks both sides of the City's pier, has three main surf breaks. Located near the City's downtown area, it is accessible by car with ample parking with fees (Guisado et al. 2013). The beach's best surfing seasons are summer and winter,

and appropriate for all surfing skill levels (Guisado et al. 2013). Its use is categorized as "Crowded" (Guisado et al. 2013). Its location is shown in Figure 4.12-1.

Located within the City's boundaries, but under the jurisdiction and management of the DPR, San Clemente State Beach is nearly 110 acres in size, including 6,000 feet of ocean frontage (City of San Clemente 2016b). In addition to the beach, it includes nature trails, 160 family campsites with picnic tables and fire rings, 72 RV sites with electrical hookups, two group camping areas for up to 50 people each, potable water, parking, showers, restrooms, and sanitation stations (DPR 2015). The campground is open year-round and has a maximum capacity of 1,370 people (Tobin 2016). Its peak use is from June through September; during the off-peak season, its average use is 50 percent of its peak use, or 685 people (Tobin 2016). During the peak season, campers are restricted to 7 nights of use; during the off-peak season, campers are restricted to 2 weeks of use. Upon leaving the campground campers are prohibited from re-entering for 30 days (Tobin 2016).

4.12.1.4 Offshore Recreation

Offshore recreation activities, such as boating and sailing, fishing, scuba diving, and wildlife and scenic viewing typically require access to harbors or marinas. Waters offshore MCBCP are open to public commercial fishing and recreational boating when not in use for military operations (EDAW 2010). The Del Mar Cantonment contains a boat basin and marina providing offshore recreational access for active and retired military, their dependents, civilian Base personnel, and guests (EDAW 2010; MCBCP 2012). It is located approximately 14 miles south/southeast of the Proposed Project site.

Other than the MCBCP Del Mar boat basin and marina, the two closest harbors to the Proposed Project site available to the public are Oceanside Harbor and Dana Point Harbor. Oceanside Harbor is immediately adjacent (south/southeast) to the MCBCP Del Mar boat basin and marina. It has two sections: the southern section has a small commercial fishing fleet, sport fishing, and watersports rentals and charters; the north section has a marina with slips for recreational boaters (San Diego Coast Life 2016). The harbor has over 900 permanent slips with an average occupancy rate of over 90 percent. In addition, three yacht brokers provide boat sales, chandlery, maintenance, repair, charters, and sailing instruction (San Diego Coast Life 2016).

Dana Point Harbor is approximately 10.5 miles west/northwest of the Proposed Project site. It is divided into an East and West Basin, both of which operate as separate marinas; combined, they have 2,500 slips for vessels of various sizes 50 guest slips, a 10-lane launch ramp, dry boat storage hoist, fishing pier, shipyard, marine fuel dock, three yacht clubs, and a commercial sports fishing operation (Dana Point Harbor Merchants Association 2016). Also used to access the Proposed Project vicinity are Newport Harbor and the Port of Long Beach/Port of Los Angeles (POLB/POLA), which are approximately 35 and 50 miles north of the Proposed Project area (EDAW 2010).

Recreational Fisheries

Recreational fishing is an important social activity in southern California. Recreational fishing gear includes rod and reel, traps, and spear fishing from boats, beaches, piers, and rocky headlands. Beach fishing and boat-based fishing are the most likely forms of fishing to take place in the project area. Boat-based fishing includes charter boats (sometimes referred to as party boats), private boats and kayaks. Fishing from human-made structures such as jetties, piers and breakwaters constitutes approximately a third of the total recreational catch for Los Angeles, Orange and San Diego counties; however, no structures are in the project area. From 2012 through 2016 (Table 4.12-3), kelp bass, barred surfperch, pacific mackerel, and barred sandbass constituted nearly half the fishes reported as caught by recreational fishermen in the Los Angeles, Orange and San Diego County region (RecFIN 2018).

Kelp bass have been the most abundant species in the recreational catch for three of the five years assessed. Barred Surfperch was the most abundant species for the remaining 2 years, although the reported catch for this species varies greatly between years, with 2014 equivalent to less than half the reported catch estimate of 2012 or 2015. In 1953, state regulations made it illegal to sell both kelp bass and barred sand bass, so there is no commercial harvest today; however, they are a large component of the sport catch. Kelp bass are one of 375 recreational fishery species managed by CDFW in accordance with the policies of the Marine Life Management Act.

Recreational fishermen also target California spiny lobster (*Panulirus interruptus*) using hoop nets, breath hold, or SCUBA gear. Divers usually find lobsters during the day on rocky reefs in caves and cracks or at night outside these habitats. According to Fish and Game Code section 29.80, SCUBA and breath-hold divers in California may only take lobster by hand (i.e., the use of spears or other implements is not allowed). Some divers also pursue lobsters at night, although this is likely to be less frequent than during the day due to the increased safety risk of boat or diving at night. Hoop nets are typically deployed from human-made structures or boats and are more often deployed at night. At night, divers may also target lobsters on sandy seabed as they are more likely to be found moving around and are easier to catch. The recreational fishery for lobster in California is seasonally limited; usually recreational lobster take is only allowed during the months of October through the middle of March.

Other invertebrates are taken by recreational fishermen year-round. Pismo clam (*Tivela stultorum*) are a large clam species relative to many bivalves found in subtidal soft sediment habitats and are the most popular bivalve taken by recreational fishermen in the subtidal area in Southern California. Rock scallops are also taken by divers. These cryptic bivalves attach to rocky reef and other hard substrate, and are pried away by divers by hand, typically using a knife or abalone iron. Scallops may occur on structures that would be removed during decommissioning, as well as local reefs such as the San Onofre Kelp

reef. Crustaceans, in particular rock crabs, are also a popular target for recreational fishermen. Recreational fishermen typically target rock crabs with hoop nets that are often left in place for several hours. These devices are often deployed from boats with buoys attached, or from human-made structures such as jetties, piers and breakwaters. It is also legal to take crab by hand as a diver in California; however, crab is less commonly observed and harder to capture for divers than lobster.

Table 4.12-3. Mean Recreational Catch[1] (Los Angeles, Orange, San Diego Counties: 2012-2016)

Common Name	Species Name	Proportion Caught	Cumulative Proportion
Kelp Bass	*Paralabrax clathratus*	22.3	22.3
Barred Surfperch	*Amphistichus argenteus*	14.0	36.3
Pacific Mackerel	*Trachurus symmetricus*	9.0	45.3
Barred Sandbass	*Paralabrax nebulifer*	4.2	49.5
Vermilion Rockfish	*Sebastes miniatus*	3.2	52.8
California Scorpionfish	*Scorpaena guttata*	3.2	56.0
Rockfish Genus	*Sebastes spp.*	2.8	58.8
Pacific Bonito	*Sarda chiliensis lineolata*	2.8	61.6
Pacific Sanddab	*Citharichthys sordidus*	2.3	63.8
Surfperch Family	*Embiotocidae*	2.1	65.9
Pacific Barracuda	*Sphyraena argentea*	2.0	67.9
Silver Surfperch	*Hyperprosopon ellipticum*	1.8	69.8
California Sheephead	*Semicossyphus pulcher*	1.3	71.1
Yellowtail	*Seriola lalandi*	1.3	72.4
Bocaccio	*Sebastes paucispinis*	1.2	73.5
Ocean Whitefish	*Caulolatilus princeps*	1.1	74.6
Sanddab Genus	*Citharichthys spp.*	1.0	75.6

Source: RecFIN 2018.
Note: [1] Recreational catch is limited to boat- and beach-based fishing modes.

4.12.2 Regulatory Setting

Relevant federal and state laws, regulations, and policies that pertain to recreation and public access are summarized in Appendix A. At a local jurisdictional level, only lands in the City of San Clemente fall within the 5-mile radius of the recreation-public access study area. Although the City does not have direct jurisdiction or permit authority over the Proposed Project; the City's Beaches, Parks and Recreation Element provides goals, policies, and implementation measures for the City's recreational programs, facility acquisition and development, existing resources, public health and wellness, and facility financing and economics (City of San Clemente 2016a). Figure 4.12-1 provides a map of the public parks, trails, and beaches within the City's jurisdictional boundaries that fall within the recreation-public access study area. The City's Local Coastal Program/Land Use Plan (LCP/LUP), adopted in 2016, contains the City's goals and policies for public access and recreation, including parks, trails, and beaches (City of San Clemente 2016b).

4.12.3 Significance Criteria

The significance criteria used to evaluate the Project impacts to recreation and public access are based on Appendix G of the State CEQA Guidelines. According to Appendix G of the State CEQA Guidelines, a significant impact would occur if the Project would:

- Cause permanent restrictions or prohibitions on existing public access to shoreline lands or water and non-water recreational facilities.
- Increase the use of existing local and regional parks or other recreational facilities, including campgrounds, such that substantial physical deterioration of the facility would occur or be accelerated.
- Threaten the safety of recreational users.

4.12.4 Environmental Impact Analysis and Mitigation

Since some decommissioning activities would occur adjacent to the SONGS upland site, along the shoreline, and offshore, the Proposed Project has a potential to restrict public access to, or increase the use of, recreational facilities, or expose the public to hazardous conditions. Table 4.12-4 summarizes the Proposed Project's potential impacts to recreation and public access, and any mitigation and Applicant-proposed measures (APMs) recommended to reduce all impacts to a less-than-significant level.

ENVIRONMENTAL IMPACT ANALYSIS

Impacts of the proposed Project and recommended mitigation measures (MMs) are examined in this section.

Impact REC-1: Reduction of Public Access to Recreational Facilities.

Decommissioning activities within the Proposed Project area could have temporary, intermittent adverse impacts on upland, shoreline, and water-dependent recreation **(Less than Significant with Mitigation).**

Impact Discussion

The Proposed Project may temporarily restrict or prohibit public access to upland, shoreline, and water-dependent recreational facilities due to decommissioning activities. During the Proposed Project, access for construction personnel and equipment could intermittently close portions of the Old Pacific Highway bicycle route next to the Proposed Project area, which is currently used by the public and military personnel. Although peak periods of demolition would not occur continuously, unless notices or alternative routes are provided, bicyclists could be impacted by Proposed Project activities.

Activities such as removing the intake and discharge conduits and buoys, and potentially grading the South Yard Facilities Area to drain to the beach (see Section 2.3.7), would

intermittently preclude the public and military personnel from accessing areas along and near the shoreline; these preclusions would periodically prevent activities such as surf fishing and clamming, sand play and shell collection, picnicking, sunbathing, swimming, and kayaking. The Proposed Project's shoreline activities are expected to occur over a 36-day period and offshore activities are scheduled to take place over a 95-day period. These two periods of activity would occur about 30 days apart from each other. Proposed Project nearshore and offshore activities would occur a minimum of 0.3 mile away from Trestles, Surf, and Bluffs Beaches, as well as the City's T-Street Beach, and thus would not likely affect their respective point or reef surf breaks. Although an occasional surfer could be periodically precluded from accessing areas immediately offshore of the facility and its conduits during high-surf events, these instances would not occur continuously and would be considered a brief inconvenience due to the availability of other nearby surf locations. Therefore, less than significant recreational impacts to surfers would occur.

Further offshore, Proposed Project activities, including the anchoring of barges and use of three to four 10- by 10-foot temporary seafloor laydown areas, would periodically prevent activities such as scuba diving and snorkeling, recreational boating and fishing, and windsurfing. The barges and other vessels required for the Proposed Project would be expected to be deployed from the POLB/POLA and anchor offshore the Proposed Project site adjacent to the intake and discharge conduits and buoys; therefore, they would not be expected to substantially affect the availability of slips, operations, and services associated with the MCBCP Del Mar boat basin and marina, Oceanside Harbor, or Dana Point Harbor. However, the presence of the barges and vessels could periodically interfere with navigation into and out of these harbors and marinas, resulting in significant impacts.

As a result of D&D activities, the surface drainage system serving the Onshore Site would be modified or eliminated, potentially directing surface runoff to the ocean via openings at the top of the seawall. This surface runoff could flood the Beach Access Walkway and potentially pose a hazard to pedestrians. This potential impact is discussed under Impact WQ-5 in Section 4.9, *Hydrology and Water Quality*, and would be mitigated to a less-than-significant level through implementation of MM WQ-5.

As an APM (see Table 4-2, *Applicant-Proposed Measures*), SCE will submit a Notice to Local Mariners to ensure that impacts to offshore recreation and safety would be reduced.

APM-18: Notification to Local Mariners. The Applicant ~~and/~~or its contractor shall be responsible for Local Notices to Mariners (as per U.S. Coast Guard requirements) and compliance with all navigational protocols of the U.S. Department of the Navy, including vessel and diving restrictions in the Proposed Project's offshore area. The notifications shall include the location of moored vessels, likely transit routes, and approximate dates, durations, and working hours. The notices shall be submitted prior to start of any offshore activities and

electronic copies posted for review by California State Lands Commission and California Coastal Commission staffs.

Mitigation Measure

With the inclusion of **MMs REC-1a and 1b**, impacts to onshore recreation would be reduced to less than significant with mitigation.

MM REC-1a: Public Notification. In areas where decommissioning activities would impact recreational facilities, the Applicant ~~and/~~or its contractor shall place warning signs, and if needed, implement detour routes, 24 hours prior to implementation of those activities.

In addition, the Applicant or its contractor shall maintain for the duration of Proposed Project activities a public website that provides Proposed Project-related information including but not necessarily limited to offshore work schedules, Traffic Plans, Local Notices to Mariners, and any anticipated closures to bicycle and pedestrian lanes, public accessways, or beaches.

MM REC-1b: Public Access Plan. The Applicant ~~and/~~or its contractor shall develop a Public Access Plan to ensure public access around the Proposed Project area is not significantly affected. The Plan shall avoid:

- Any long-term increase in traffic that would conflict with adopted policies, plans, or programs supporting alternative transportation; or obstruct current access to and around the Proposed Project area~~.~~
- Restrictions on roads used to access San Onofre State Beach both north and south of the Proposed Project area that would result in a full road closure or substantial distruptions~~.~~

The Plan would require, but not be limited to the following:

- Implementation of the Plan by trained personnel
- Appropriate posting of traffic and safety signs
- Haul truck trips to be concentrated during off-peak hours during project construction to the extent practicable. Trucks trips shall be scheduled to avoid weekends and holidays to maximum extent possible.

The plan shall be submitted to California State Lands Commission staff for review and approval a minimum of 30 days prior to ~~decommissioning~~ Proposed Project activities.

Impact REC-2: Increased Use of Existing Local and Regional Parks or Other Recreational Facilities

The influx of additional personnel to the Proposed Project area may cause the deterioration of existing local and regional parks or other recreational facilities, including campgrounds **(Less than Significant).**

Impact Discussion

The Proposed Project would use up to 670 on-site construction workers for the Project duration. Most personnel would likely be drawn from construction labor pools within San Diego and Orange Counties, and would commute to/from the Proposed Project site and home daily; however, some specialized personnel may need to be drawn from labor pools outside of the San Diego/Orange County area. In these cases, construction crews may use camping facilities at San Onofre and San Clemente State Beaches for temporary housing, which could lead to potential overuse of the facilities; however, both State Beaches have limitations on the number of days campers can use their respective campgrounds, and how frequently the campgrounds can be re-accessed. Consequently, no permanent effects due to the increased use of local parks and recreational facilities are anticipated because there would not be a net permanent increase in local populations due to the Proposed Project. Therefore, impacts would be less than significant.

Mitigation Measure

No MMs are recommended for Impact REC-2.

Impact REC-3: Create Hazards for Recreationists.

Recreational users could be potentially impacted by hazardous activities **(Less than Significant with Mitigation).**

Impact Discussion

The Proposed Project would involve activities outside of the physical boundaries of the Proposed Project site, including closures of the Old Pacific Highway bicycle route due to Proposed Project site access and staging, shoreline and offshore demolition, and dispositioning of the Units 2 and 3 offshore conduits and buoys. With the implementation of APM-18, impacts would be reduced, but not to a less-than-significant level.

APM-18: Notification to Local Mariners.

Mitigation Measure

Implementation of **MM REC-1a** would ensure that recreationists are kept clear of hazardous areas, thereby avoiding potential significant impacts to the safety of recreational users and reducing the impacts to less than significant with mitigation.

MM REC-1a: Public Notification.

Please see Section 4.1, *Hazardous and Radiological Materials*, for an in-depth discussion concerning the risk of radiological contamination and the potential for such an event to close local beaches and offshore areas, thereby preventing their recreational use.

4.12.5 Cumulative Impacts

As discussed in Section 3.2, *Relevant Cumulative Projects*, and shown in Table 3-2, 10 reasonably foreseeable cumulative projects fall within the geographic area near SONGS considered for potential cumulative impacts related to recreation and public access. In addition, long-term beneficial impacts to recreation and public access are an ongoing result of the completed SONGS Riprap and Public Access Walkway Repairs Project (ID No. 5 in Table 3-2). As discussed in Section 4.12.4, *Environmental Impact Analysis and Mitigation*, the Proposed Project would not induce substantive long-term population growth and thus would not contribute to a cumulative increase in use of existing recreational facilities. Furthermore, the Proposed Project would not permanently impact recreational facilities or public shoreline access. Impacts would include temporary and periodic disruptions to offshore and onshore recreational resources and shoreline public access, as well as the potential to affect the safety of recreational users; however, all impacts would be less than significant or less than significant with mitigation. Therefore, the Proposed Project would not make a considerable contribution to cumulative effects associated with recreation and public access.

4.12.6 Future Activities

Implementation of Future Activities could affect recreational activities in a manner similar to those of the Proposed Project. Implementation of onshore Future Activities could require additional DoN approval and issuance of a CDP amendment by the CCC in 2035. Removal of the solid covers over the mammal exclusion barriers on the Unit 2 discharge conduit, and if required by the Commission, removal of the remaining discharge conduit diffuser ports would result in short-term offshore impacts similar to Proposed Project activities. As proposed, the Applicant intends to only remove exposed rock riprap to -2 Mean Lower Low Water <u>if the DoN ultimately requires removal of the seawall and walkway</u>. Should the DoN and CCC both make provisions that the existing public walkway for shoreline access remains intact, no impacts to public shoreline access would occur. If the DoN and CCC both determine that the existing public walkway and shoreline rock riprap should be removed, adverse impacts to public shoreline access could occur; however, at this time the significance of these impacts cannot be determined without speculation. If impacts from Future Activities are found to be significant, the implementation of measures similar to APM-18 and MM REC-1a may be appropriate.

4.12.7 Summary of Proposed Mitigation Measures

Table 4.12-4 provides a summary of the mitigation and Applicant-proposed measures.

Table 4.12-4. Recreation and Public Access Impact/Mitigation Summary

Impact	MM/APM
REC-1: Reduction of Public Access to Recreational Facilities	APM-18: Notification to Local Mariners MM REC-1a: Public Notification MM REC-1b: Public Access Plan
REC-2: Increased Use of Existing Local and Regional Parks or other Recreational Facilities	None recommended
REC-3: Create Hazards for Recreationists	APM-18: Notification to Local Mariners MM REC-1a: Public Notification

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4.13 TRANSPORTATION AND TRAFFIC

This section describes existing transportation facilities in the Proposed Project area, including roadways and traffic, rail corridors, and non-motorized transportation modes. This section also identifies applicable significance thresholds, assesses the Proposed Project's impacts to transportation and traffic and their significance, and recommends measures to avoid or substantially reduce any effects found to be potentially significant.

4.13.1 Environmental Setting (Onshore)

The primary transportation/traffic impacts associated with the Proposed Project would be associated with truck, rail, and marine vessel trips associated with removal of waste resulting from decontamination and dismantlement (D&D) activities, as well as import of backfill material and worker vehicle trips to and from SONGS. Decommissioning waste associated with the ~~offshore~~ onshore decommissioning work would affect a large area of Southern California. Executive Order No. D-62-02 (California Office of Governor 2002), established a moratorium on in-state disposal of decommissioning wastes at Class III landfills and unclassified waste management units in California; therefore, all decommissioning wastes would be shipped out of state. All decommissioning wastes transported from SONGS, and conduit removal decommissioning wastes received at and transported from the Port of Long Beach/Port of Los Angeles (POLB/POLA), are assumed to be hauled out of state. It has not been specified where D&D waste material would be transported for processing and disposal; however, as referenced in Section 2.3.8, *Decommissioning Waste Volumes and Disposal Sites*, options for waste disposal facilities include locations in Clive, Utah (located approximately 60 miles west of Salt Lake City) or Oak Ridge, Tennessee for Class A low-level radioactive waste (LLRW); and Waste Control Specialist (WCS) in Andrews County, Texas, located approximately 200 miles east of El Paso, Texas (for Class A/B/C LLRW). If available, the Participants may use other licensed Class A, B, or C LLRW facilities or an NRC exempt facility. Non-Radiological wastes are proposed to be trucked to the La Paz County Landfill in Arizona, located near the Arizona/California border east of Blythe.

As discussed in Section 2.3.8, *Decommissioning Waste Volumes and Disposal Sites*, the Applicant may recycle some materials, such as scrap ferrous metals that meet NRC unrestricted release criteria. Any recycled metals that meet the unrestricted release criteria would likely be sent via truck to the POLB, approximately 60 miles from SONGS, for likely recycling outside of the U.S. (SCE 2016b – Data Request [DR] #1-29).

4.13.1.1 Transport Routes to Disposal Sites

The calculated peak/worst-case years for Proposed Project activities would be 2023 through 2024 for truck and rail trips. Most of the Proposed Project waste is expected to be shipped by truck. Off-site trucking would normally occur during workday daytime hours, but may also occur between 6:00 p.m. and 6:00 a.m. Most rail transport shipments would

use the manifested train traffic option, defined as small (5- to 15-car) blocks of outbound loaded rail cars released as manifested traffic to the Burlington Northern Santa Fe (BNSF) line (SCE 2016a – DR #1-30). Handling of rail cars at SONGS would be performed by DGC personnel. Once the rail cars are released from the SONGS site, performance would be the responsibility of PSRR and BNSF.

All shipping requirements (i.e., NRC, railroad, U.S. and California Departments of Transportation) must be met for all waste types; once met, there are no specific route limitations by waste type. Depending on the route, physical restrictions may be placed on some larger component shipments, including weight or dimension restrictions (i.e., oversize, heavy load). All restrictions must be met to ensure safe and compliant transport of the waste. Until the DGC finalizes its approach to packaging waste, specific physical restrictions are unknown. For example, the SONGS Unit 1 reactor pressure vessel would require specific planning for both oversize and overweight transport from the site.

Anticipated routes to the disposal sites are outlined below (see also Section 2.3.8, *Decommissioning Waste Volumes and Disposal Sites*).

Clive, Utah

A small volume of Radioactive Class A containerized waste and Radioactive Class A mixed waste is proposed to be trucked to Clive. However, the majority of the LLRW is proposed to be shipped by rail to the Clive, Utah, waste disposal site approximately 80 miles west of Salt Lake City. The LLRW rail transport shipments would be gathered as five to 15 rail car shipments on the existing on-site rail spur. By regulation, rail cars placarded RADIOACTIVE cannot be placed next to a locomotive or an occupied caboose. A buffer car loaded with any non-radioactive material must be placed between a car carrying radioactive materials and a locomotive or caboose. The gathered rail cars would then be transferred overnight (between 11 p.m. and 5 a.m.) to the Stuart Mesa Railyard, located approximately 14 track miles south of the SONGS rail spur, by PSRR using a large switcher locomotive. Pacific Sun Railroad (PSRR) would then transfer the railcars to Burlington Northern Santa Fe (BNSF) for the long-haul shipment to Utah. BNSF would ship these railcars north through San Diego and Orange Counties and then east through Riverside and San Bernardino Counties via manifest trains see Figure 4.3-2; Section 4.3, *Air Quality*). An alternative site may be considered in Oak Ridge, Tennessee.

Andrews County, Texas

Radioactive Class B and C wastes are proposed to be shipped by truck to Andrews, Texas (see Figure 4.3-2; Section 4.3, *Air Quality*). These wastes would be routed from the site north along Old Pacific Highway to Basilone Road, which has an interchange with Interstate (I-) 5. The rest of the travel route in California would use freeways, first south along I-5 and I-805 to I-8, which would be used for the rest of the route east to the

California border with Arizona. This travel route would pass through San Diego and Imperial Counties.

La Paz County, Arizona

Non-Radiological decommissioning wastes are proposed to be shipped by truck to the La Paz County Landfill in Arizona (see Figure 4.3-2; Section 4.3, *Air Quality*). There are no time-of-day restrictions for hauling these wastes off-site, but the outbound and inbound truck trips would normally occur during workday daytime hours. The waste trucks would be routed from the site north along Old Pacific Highway to Basilone Road, which has an interchange with I-5. The rest of the travel route would be on freeways and interstate highways, and perhaps tollways depending on contractor preference, to the northwest then north and northeast to reach I-10, which would be used for the rest of the travel route east to the California border with Arizona. This travel route would pass through San Diego, Orange, Riverside, and potentially San Bernardino Counties. The offshore Non-Radiological decommissioning waste that emanates from the POLB/POLA are assumed to be routed north from the Port via I-710 and then would join I-10 east by any of several freeways. This travel route would pass through Los Angeles, Riverside, and potentially Orange or San Bernardino Counties. Figure 4.3-2 in Section 4.3, *Air Quality*, shows generalized waste shipment travel routes in California.

4.13.1.2 LLRW Rail Transport Shipments

Rail trips would originate on the existing rail spur located on the Onshore Site along the east side of the power plant and enter/exit the facility via the existing switch located north of the Old Pacific Highway overcrossing at the Los Angeles-San Diego-San Luis Obispo (LOSSAN) corridor (see Figure 4.13-1).

Railroad Infrastructure

As referenced in Section 2.3.8, *Decommissioning Waste Volumes and Disposal Sites*, (see Table 2-8) up to ~~65~~56 rail shipments would occur annually during the Proposed Project. All rail cars transporting D&D waste from the SONGS onshore facility would be transported overnight to the Stuart Mesa Railyard in Oceanside by PSRR. These rail cars would be combined with larger BNSF trains for transport to the Clive, Utah, disposal location referenced above. PSRR operates under contract to BNSF and operates weekday nights on 68 miles of track serving freight customers in Escondido, the Miramar industrial area of San Diego, and between Stuart Mesa and San Onofre (Watco Companies, Inc. 2016).

The most direct freight rail route between the Stuart Mesa Railyard and Clive, Utah would be via the LOSSAN corridor north to the BNSF Transcontinental (TRANSCON) route intersection in Los Angeles County. The TRANSCON route originates at the POLB/POLA and extends east to the BNSF Intermodal Facility in San Bernardino. From San

Bernardino, the material would be hauled northeast to Barstow. From Barstow, the material would be transported northeast through Las Vegas, Nevada on a Union Pacific Railroad line and continue northeast to Salt Lake City and then west to the Clive, Utah siding (see Figure 4.3-2; Section 4.3, *Air Quality*).

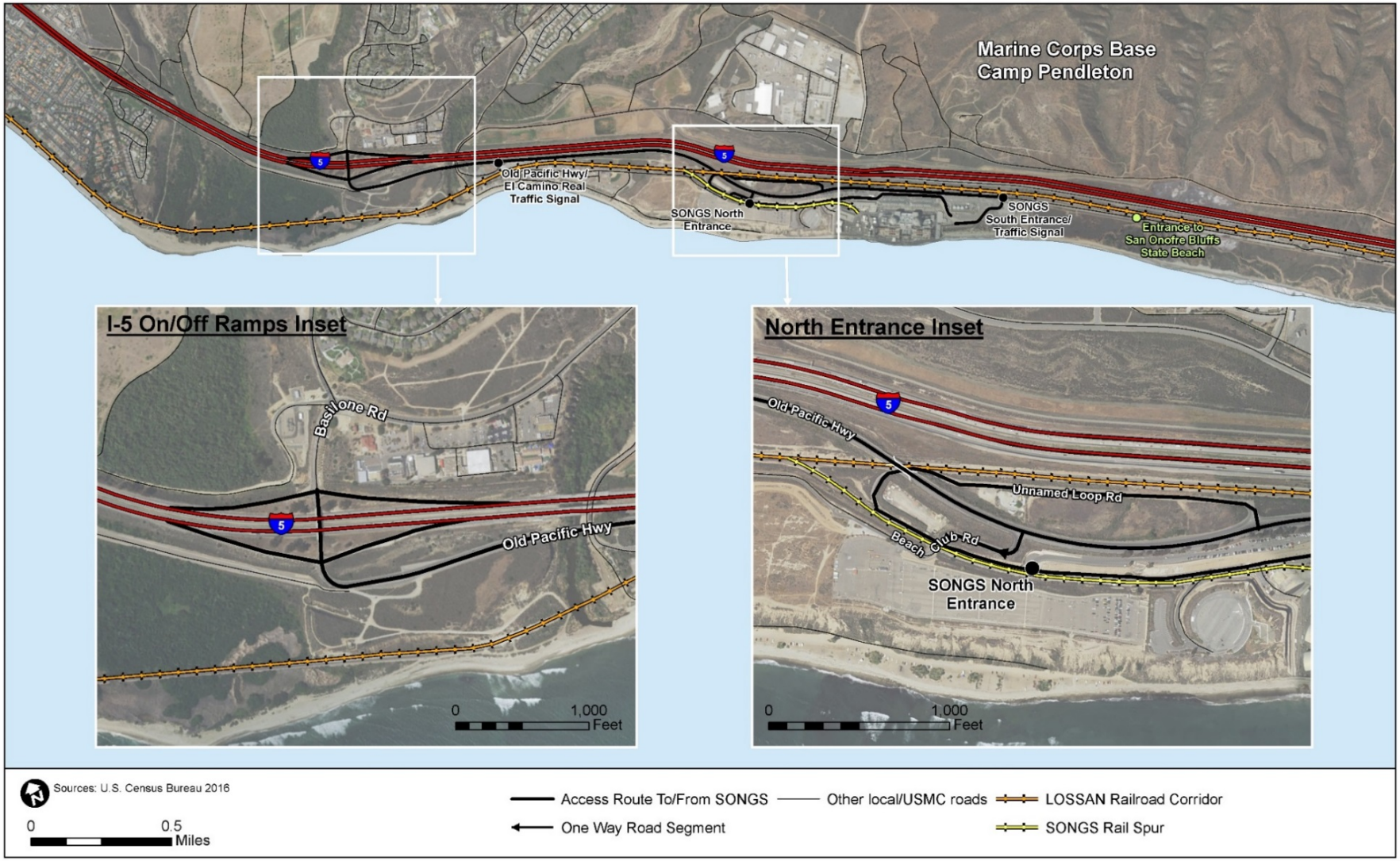
Los Angeles-San-Diego-San Luis Obispo Corridor

The 351-mile LOSSAN rail corridor is located between the City of San Luis Obispo to the north and the Santa Fe Depot in the City of San Diego. The LOSSAN corridor connects major urban areas of Southern California and the California central coast. Passenger operations on the LOSSAN line include the Amtrak Pacific Surfliner, the Southern California Regional Rail Authority Metrolink, and the North County Transit District's COASTER and SPRINTER passenger rail services. In addition to the commuter and inter-city passenger rail service, the BNSF and UPRR own portions of the corridor and provide freight rail transportation supporting the movement of goods from the ports of San Diego, Los Angeles, and Long Beach. The LOSSAN Corridor right-of-way is owned by the San Diego Metropolitan Transit System, North County Transit District, Orange County Transportation Authority, Los Angeles County Metropolitan Transit Authority, Ventura County Transportation Commission, UPRR, and BNSF. The LOSSAN corridor is managed by the LOSSAN Rail Corridor Agency. The LOSSAN Agency is governed by a Board of Directors comprised of members representing rail owners, operators, and planning agencies along the rail corridor. The Orange County Transportation Authority was named the Managing Agency of the LOSSAN Rail Corridor Agency in November 2013, and provides all necessary administrative support for the LOSSAN Agency and its Board (LOSSAN Rail Corridor Agency 2012).

The segment of the LOSSAN corridor that would be used for rail hauling is a portion of the LOSSAN South Segment. A short segment (approximately 3 miles) from SONGS north to the Orange County boundary is in San Diego County. Most of the segment used for the Proposed Project would occur in Orange and Los Angeles Counties.

- **Orange County Segment.** The 40-mile segment extends from the Los Angeles County line through Orange County to the San Diego County line. This segment has 11 passenger stations. Including Fullerton, 10 are along the section of track that could accommodate trains associated with the Proposed Project.
- **San Diego Segment.** The 60-mile San Diego segment of the LOSSAN corridor is owned by the North County Transit District and extends from the Orange County line to the Santa Fe Depot in Downtown San Diego. The segment passes through the cities of Oceanside, Carlsbad, Encinitas, Solana Beach, and Del Mar before reaching downtown San Diego. Amtrak and Metrolink trains serve San Diego County. Amtrak provides service to downtown San Diego's Santa Fe Depot with stops in Oceanside and Solana Beach. Metrolink service terminates at Oceanside.

Figure 4.13-1. Existing Road and Rail Infrastructure Near SONGS



- **Metrolink LOSSAN Operations.** The Southern California Regional Rail Authority operates the Metrolink commuter rail network throughout the Southern California service area. Within the LOSSAN corridor, Metrolink operates 23 weekday northbound trains on the segment between Oceanside and Fullerton. Of the total, six northbound trains originate in Oceanside, south of SONGS; the remainder originate in San Clemente, Laguna Niguel/Mission Viejo, or Irvine. Metrolink operates 25 weekday southbound trains on the segment between Fullerton and Oceanside. Of the total, eight southbound trains terminate in Oceanside; the remainder terminate in Irvine, Laguna Niguel/Mission Viejo, or San Clemente.
- **Amtrak LOSSAN Operations.** Amtrak's Pacific Surfliner route provides service between San Diego's Santa Fe Depot and San Luis Obispo. The Pacific Surfliner has 11 scheduled northbound trains each weekday originating in San Diego and 11 southbound trains traveling south from Los Angeles.
- **LOSSAN Freight Operations.** As referenced, both BNSF and UPRR haul freight on the LOSSAN corridor. BNSF is the primary operator on the LOSSAN corridor in San Diego and Orange Counties. Freight operations most often occur at night after/before daily commuter and passenger train operation.
- **BNSF Transcontinental Route.** The most direct route of east/west rail travel for the Proposed Project would occur between the LOSSAN corridor and the San Bernardino Intermodal Yard on the Transcontinental Route. This is a double-track freight line originating at the POLB/POLA and terminating about 2,250 miles away in Chicago, Illinois. Segments of this corridor are shared use with intercity Amtrak and Metrolink trains. D&D waste would likely be transported via the LOSSAN corridor north to the Transcontinental Route and then east to the San Bernardino Intermodal Yard, approximately 60 miles east of the Los Angeles area. From San Bernardino, the train would travel to Barstow where it would likely depart the Transcontinental Route and travel northeast on a UPRR main line through Las Vegas to Salt Lake City and then west to Clive, Utah. The five to 15 D&D waste cars would be combined into larger trains for transport northeast to the Clive, Utah, waste disposal site. Empty rail cars bound for the Proposed Project site would be shipped to the Stuart Mesa Railyard by BNSF, where they would be gathered and shipped to the site by PSRR. These empty rail cars would then be loaded with LLRW on-site during normal working hours (between 6 a.m. and 6 p.m.). The rail cars would be handled at the site using a small dedicated switcher locomotive.

4.13.1.3 LLRW Truck Transport Shipments

Vehicle trips would be concentrated at the I-5/Basilone Road interchange and on Old Pacific Highway south of the interchange between I-5 and SONGS. Regardless of the ultimate disposal location, all truck traffic would use Old Pacific Highway and the I-5/Basilone Road interchange and affect the following intersections:

- I-5/Basilone Road interchange northbound on- and off-ramps
- I-5/Basilone Road interchange southbound on- and off-ramps
- Old Pacific Highway/El Camino Real
- Old Pacific Highway/Beach Club Road north
- Old Pacific Highway/Unnamed Loop Road
- Beach Club Road North/SONGS north entrance
- Old Pacific Highway/SONGS south entrance

Level of Service (LOS)

LOS is a quality of service measure that describes the operational conditions on a transportation facility, such as a roadway or intersection. LOS is established based on the driver's perspective. This service measure is a general overall measurement of several conditions such as speed and travel time, freedom to maneuver, traffic interruption, and comfort and convenience. Safety is an important concern but, typically, is not included in the measures that establish service levels. Six LOS categories have been established using the letters A through F. LOS A represents the best operating condition with free flow and no delays, while LOS F represents the worst operating condition with long delays where the volume of traffic exceeds the capacity of the roadway. Each LOS category represents a range of operating conditions and the driver's perception of those conditions. Methods for identifying LOS vary based upon the type of transportation facility. LOS measurement is used primarily to assess how increases in vehicular traffic may affect traffic congestion on specific transportation facilities, such as freeways, arterials, and intersections. Procedures have also been established to adjust the evaluation to account for trucks, buses, roadway gradient, and pedestrian volumes. However, traffic volume increases may also result in other traffic-related impacts. Table 4.13-1 describes generalized definitions of LOS categories A through F as applied to roadway operations.

Table 4.13-1. Level of Service - Unsignalized Intersections

Level of Service	Average Control Delay (Seconds/Vehicle)	
	Unsignalized Intersections	Signalized Intersections
A	≤ 10	≤ 10
B	> 10 and ≤ 15	> 10 and ≤ 20
C	> 15 and ≤ 25	> 20 and ≤ 35
D	> 25 and ≤ 35	> 35 and ≤ 55
E	> 35 and ≤ 50	> 55 and ≤ 80
F	> 50	> 80

Source: Transportation Research Board, National Research Council 2010.

Level of Service Standards and Thresholds

State highway LOS and performance is based upon procedures derived from the 2010 Highway Capacity Manual by the Transportation Research Board of the National Academies. The procedure for calculating LOS at intersections involves estimating ~~a peak~~

~~hour volume to capacity (V/C) ratio on state highways.~~ an average control delay, measured in seconds per vehicle. The resulting peak hour ~~V/C ratio~~delay is then compared to acceptable ranges of ~~V/C~~delay values corresponding to the various LOS, as shown in Tables 4.13-1 ~~and 4.13-3~~. The corresponding LOS represents an approximation of existing or anticipated future peak hour operating conditions in the peak direction of travel. As stated in the California Department of Transportation (Caltrans) Guide for the preparation of Traffic Impact Studies (Caltrans 2002), the target LOS is C on state highway facilities. However, Caltrans acknowledges that this may not always be feasible. In these circumstances, Caltrans often accepts lower LOS for facilities currently operating below LOS C. The San Diego County General Plan Mobility Element establishes LOS D as the standard for roadway operations with the County (San Diego County 2011).

Regional Access

I-5 is the north/south regional access route connecting SONGS with the interstate highway system, and is owned and maintained by the Federal Highway Administration (FHWA) and Caltrans, District 11, headquartered in San Diego. At Basilone Road, I-5 has four travel lanes in each direction. The interchange is a diamond configuration and provides access to the Marine Corps Base Camp Pendleton (MCBCP) to the east via the Basilone Gate and to public recreational amenities and SONGS to the west.

Table 4.13-2 shows 2014 Average Annual Daily Traffic (AADT) volumes on the I-5 mainline at the Basilone Road interchange. In addition, data are provided for the Las Pulgas Road interchange, the nearest interchange to the south, and Cristianitos Road, the nearest interchange to the north of Basilone Road. Of the total AADT at the Basilone Road interchange, approximately 7.23 percent (9,471) are trucks (Caltrans 2015a).

Traffic counts were performed to obtain current volume data at all affected intersections defined above. With respect to the I-5/Basilone interchange, both on/off ramp intersections are stop controlled at the off-ramp intersection with Basilone Road. No signalized intersections are located at this interchange. Traffic counts were performed on October 12, 2016, for both morning and evening peak hour periods. Peak hours are defined as the one hour between 7:00 a.m. and 9:00 a.m. and 4:00 p.m. and 6:00 p.m. when volumes are highest, and are the time periods commonly used to assess traffic operating conditions. Table 4.13-3 shows morning (a.m.) and evening (p.m.) peak hour counts for the I-5/Basilone Road off-ramps. On-ramp volumes were calculated based on collected turning movement data.

Table 4.13-2. 2014 Mainline I-5 Traffic Counts

Interchange	Back Peak Hour [1, 2]	Back Peak Month [3]	Back AADT [4]	Ahead Peak Hour [5]	Ahead Peak Month [6]	Ahead AADT [7]
Las Pulgas Road (Mile 62.0)	11,200	146,000	132,000	10,800	146,000	131,000
Basilone Road (Mile 71.3)	10,800	146,000	131,000	11,300	142,000	138,000
Christianitos Road (Mile 72.3)	11,300	142,000	138,000	11,400	143,000	139,000

Source: Caltrans 2015a.
Acronym(s): AADT = average annual daily traffic.
Notes:
[1] Peak hour is the 1 hour period between 7:00 a.m. and 9:00 a.m. and 5:00 p.m. to 7:00 p.m. when volumes are heaviest.
[2] Back peak hour are peak hour volumes approaching the interchange.
[3] Average daily traffic for month of heaviest (peak) traffic flow approaching the interchange.
[4] Back AADT is Average Daily Traffic Volumes approaching the interchange, which are calculated by totaling annual traffic volumes and dividing by 365.
[5] Ahead peak hour are peak hour volumes departing the interchange.
[6] Average daily traffic for month of heaviest traffic flow departing the interchange.
[7] Average annual daily traffic departing the interchange.

Table 4.13-3. Peak Hour Traffic Counts

Intersection		Peak Hour	
		A.M.	P.M.
I-5/Basilone Road Northbound and Southbound Ramp Volumes	Northbound exit-ramp	173	117
	Northbound entrance-ramp	270	423
	Southbound exit-ramp	346	274
	Southbound entrance-ramp	127	275
Old Pacific Highway	Old Pacific Highway/El Camino Real	169	272
	Old Pacific Highway/Beach Club Road North	165	261
	Old Pacific Highway/Unnamed Loop Road	83	212
	SONGS Access North	44	56
	SONGS Access South	41	47

Source: DC Engineering Group 2018 (Appendix I, Tables 3-2 and 3-3).

Local Access

Old Pacific Highway (Old Highway 101). Local access to SONGS is provided by Old Pacific Highway, which extends south from the Basilone Road interchange along the west side of I-5 and ends at the entrance to San Onofre Bluffs State Park (Figure 4.13-1). The paved road has two travel lanes in each direction between Basilone Road and the LOSSAN corridor overcrossing. South of this point, the road varies from two lanes to one lane in either direction. There are two signalized intersections – one at the intersection with El Camino Real and the other at the SONGS south access entrance/exit. Table 4.13-3 shows morning (a.m.) and evening (p.m.) peak hour traffic counts at each of the intersections located along Old Pacific Highway between Basilone Road and the south SONGS access road.

El Camino Real. El Camino Real is a two-lane paved road that provides access at a signalized intersection from Old Pacific Highway to MCBCP via a gated access point on El Camino Real, just north of the intersection with Old Pacific Highway. Vehicles pass through the gate and then loop under I-5 to access MCBCP facilities on the east side of I-5. The Proposed Project traffic would not use El Camino Real but would affect operation of the Old Pacific Highway/El Camino Real signalized intersection.

Beach Club Road. Beach Club Road is a two-lane paved road that provides access to the SONGS north gated entrance road and a northern SONGS parking area. Further to the north, Beach Club Road provides access to San Onofre State Beach and the MCBCP's military recreational area (the primary access to the military recreational area is from the segment of Beach Club Road on the other side of this recreational area that then crosses under I-5 into MCBCP). After turning right from Old Pacific Highway onto a 0.1-mile one-way segment of Beach Club Road there is a four-way stop-controlled intersection located west of Old Pacific Highway where vehicles can (1) proceed straight to the SONGS parking lot or San Onofre State Beach, (2) turn left to access the SONGS restricted access north entrance, or (3) turn right onto the Unnamed Loop Road (described below), loop under Old Pacific Highway, and return to Old Pacific Highway approximately 0.25 mile south of the Old Pacific Highway/Beach Club Road intersection to the north. The Beach Club Road intersection with Old Pacific Highway uses a dedicated right turn lane that does not have any signal or stop controls. The Proposed Project's truck traffic would only use the 0.1-mile one-way segment of Beach Club Road to access the north gated entrance.

Unnamed Loop Road. The unnamed loop road connects the SONGS north entrance driveway exit and Beach Club Road South to Old Pacific Highway at both ends of the loop (given the extra travel distance, the southern intersection of the Unnamed Loop Road with Old Pacific Highway is not the assumed access route to the SONGS north entrance or Beach Club Road). All egress from the SONGS north entrance, unrestricted middle entrance, and north parking area, and all egress from San Onofre State Beach, must use this road to access Old Pacific Highway.

SONGS Access Driveways (entrances). SONGS has three access driveways: northern, middle, and southern. The northern and southern driveways provide restricted access, through security gates, to the SONGS site and would likely be used for Proposed Project truck traffic. The middle entrance driveway, which would not be used by the Proposed Project's truck traffic, provides access to unrestricted areas within SONGS that includes a parking lot and an administrative building.

Existing Roadway Level of Service

To establish baseline traffic operational conditions at the study area intersections, existing LOS was calculated. The LOS and accompanying vehicle delay are shown in Table 4.13-

4. As shown, the LOS at all study area intersections currently meets the minimum standards described above as established by Caltrans and the County of San Diego.

Table 4.13-4. Existing Plus Projected Levels of Service

	Intersection	Traffic Control	Peak Hour	Baseline		Proposed Project	
				Delay (seconds)	**LOS**	**Delay** (seconds)	**LOS**
1	Basilone Road /	OWSC	AM	10.8	B	11.5	B
	I-5 NB Ramps		PM	11.5	B	12.5	B
2	Basilone Road /	OWSC	AM	14.2	B	16.4	C
	I-5 SB Ramps		PM	20.0	C	24.0	C
3	El Camino Real /	Signal	AM	3.8	A	2.5	A
	Old Pacific Highway		PM	3.6	A	2.6	A
4	Beach Club North /	N/A	AM	N/A	A	N/A	A
	Old Pacific Highway		PM	N/A	A	N/A	A
5	Unnamed Loop Road /	OWSC	AM	8.7	A	9.6	A
	Old Pacific Highway		PM	8.8	A	9.7	A
6	SONGS North Entrance /	OWSC	AM	7.3	A	7.6	A
	Beach Club North		PM	7.3	A	7.6	A
7	SONGS South Entrance/	OWSC	AM	4.0	A	15.4	B
	Old Pacific Highway		PM	16.9	B	15.9	B

Source: DC Engineering Group 2018 (Appendix I, Tables 3-6 and 5-1).
Acronyms: Acronyms: LOS = level of service; N/A = not applicable; NB = northbound; OWSC = One-Way Stop Control; SB = southbound.

4.13.1.4 Bicycle Infrastructure

The Pacific Coast Bicycle Route, which extends between the California border with Oregon and the International Border with Mexico, provides commuter access between adjoining communities, while longer segments accommodate recreational bicycle users. A segment of this bikeway traverses San Diego County and serves interregional users.

Bicycle facilities are generally classified as Shared Roadway (no bikeway designation), Class I Bikeway (Bike Path), Class II Bikeway (Bike Lane), or Class III Bikeway (Bike Route). Class I Bike Paths provide right-of-way for exclusive use of bicyclists and pedestrians. They minimize crossflow by motorists and reduce the influence of parallel streets/highways. Class II Bike Lanes are established along streets where there is significant bicycle demand. Bicycle lanes are delineated with bike lane signs and pavement markings to separate them from lanes assigned to motorists. Class III Bike Routes are shared facilities with motorists on the street, or with pedestrians on sidewalks. They are intended to provide connection to other bicycle facilities, and also designate preferred routes through high demand corridors. Class III routes are established by placing signage along the roadway.

Bicycle access along Old Pacific Highway near SONGS consists of one segment of a 20-mile-long bicycle route between Oceanside to the south and San Clemente to the north (see Figure 4.12-1 in Section 4.12, *Recreation and Public Access*). This segment includes

a combination of Class I, II, and III bicycle lanes. From Oceanside, northbound bicyclists can ride through MCBCP beginning at Hill Street and exiting at Las Pulgas Road. This route is subject to periodic closure for military operations. When this occurs, bicyclists use the shoulder of I-5 between Hill Street and Las Pulgas Road. At Las Pulgas Road, bicyclists use a segment of Old Pacific Highway north of the I-5/Las Pulgas Road interchange east of and parallel to I-5. This two-way access curves west and under I-5 to the south end of San Onofre Bluffs Campground. The route continues via the access road, passing a ranger station at the north end of the State Park, then onto the segment of Old Pacific Highway that serves SONGS. The segments between Las Pulgas Road and the State Park and through the State Park are Class I and Class III, respectively.

At SONGS, Old Pacific Highway has one lane in each direction with striped Class II bicycle lanes. North of SONGS to Basilone Road, Old Pacific Highway has two lanes (Class III) in each direction with shoulders in most areas for bicycles. Just south of Basilone Road, northbound bicyclists leave Old Pacific Highway and cross Basilone Road at the Old Pacific Highway/Basilone Road intersection and continue north on the west side of Old Pacific Highway. North from Basilone Road, a segment of Class I bicycle path continues north to Christianitos Boulevard.

The number of bicyclists using the segment through MCBCP is based on data obtained from the U.S. Department of Defense for MCBCP. To access the bicycle route via MCBCP, riders must be pre-screened. A record of all bicycle access through MCBCP is maintained by the U.S. Department of Defense. Based on MCBCP data, between 200 and 300 bicyclists use the base on a typical weekday and nearly 1,000 riders pass through MCBCP on weekends. For this evaluation, this number is assumed to be representative of those bicyclists passing by or riding near SONGS daily.

4.13.1.5 Pedestrian Pathways

The Community Trails Master Plan (CTMP) is the implementing document for the County Trails Program (CTP), which is the guiding document for multi-use trails and pathways throughout unincorporated San Diego County. The CTP encompasses regional facilities (which span long linear distances that cross multiple communities and function as a backbone for local trail networks) and community facilities (which serve local needs and are contained in the CTMP). Regional and community facilities are further separated into the classification of trails and pathways. Trails are typically located away from vehicular roads, are primarily recreational in nature but can also serve as an alternative mode of transportation. They are soft-surface facilities for single or multiple uses by pedestrians, equestrians, and mountain bikers serving both circulation and recreational purposes. Trail characteristics vary depending on location and user type. Pathways are facilities located within a parkway or road right-of-way. A riding and hiking trail located in the road right-of-way is considered a pathway. Pathways help make critical connections and are an integral part of a functional trail system.

The Proposed Project area includes trails used to access public beaches north of SONGS and within the San Onofre Bluffs State Park. San Diego Section 1 of the California Coastal Trail is located along the beach. This segment is referenced with all completed segments of the trail in San Diego County CTMP (County of San Diego 2005). Improved sidewalks are limited in this area. Pedestrian activity occurs along Old Pacific Highway; however, it is concentrated near the informal drop off/pick up areas located at the north end of the study area near the Old Pacific Highway/Basilone Road intersection.

4.13.2 Environmental Setting (Offshore)

Offshore traffic in the Proposed Project area consists primarily of activities associated with MCBCP. Nearby offshore areas include the Camp Pendleton Amphibious Assault Area and MCBCP Amphibious Vehicle Area (EDAW 2010). Other vessel traffic in the area includes commercial and sport fishing, recreational boating out of the Del Mar Boat Basin or Dana Point Harbor roughly 13.9 miles south and 10.5 miles west/northwest of SONGS, respectively, ferry traffic between Dana Point Harbor and Avalon (Catalina Island), and vessel traffic in and out of the POLB/POLA.

Marine vessel traffic within and approaching the POLB is managed by two separate entities: (1) the Vessel Traffic Service, and (2) Jacobsen Pilot Service (POLB 2017). The Vessel Traffic Service is jointly operated by the U.S. Coast Guard and the Marine Exchange of Los Angeles/Long Beach. Jacobsen Pilot Service is the sole piloting company for the POLB and provides navigation services into and out of the POLB.

Marine vessel traffic is typically measured in numbers of port calls per vessel and the number of crew and supply boats or barges that traverse affected waterways. According to the POLB 2015 Air Emissions Inventory, 1,988 ocean-going vessels, an average of 5.4 per day, departed the POLB in 2015 (POLB 2015, Table A.2). Ocean-going vessels include large containerships, auto carriers, tankers, and other miscellaneous bulk carriers, which are larger than the vessels required for the Proposed Project. In the same POLB 2015 inventory, there were 87 harbor craft actively operating out of the POLB (POLB 2015, Table 8.6). These types of vessels include tugboats, crew boats, ferries, and other work boats similar to those that could be used for the Proposed Project.

In the ocean and nearshore areas of POLB, marine vessel traffic is coordinated with a Traffic Separation Scheme (TSS). A TSS is an internationally recognized vessel-routing designation that separates opposing flows of vessel traffic into lanes (similar to those on a roadway), including a buffer between lanes where traffic must be avoided. TSSs are designed to help direct offshore vessel traffic along portions of the California coastline. While vessels are not required to adhere to a designated TSS, failure to use one could be a factor in determining liability if a collision occurs.

The TSS that controls access to POLB is divided into two approaches: Western and Southern (Marine Exchange of Southern California [MXSOCAL] 2001). Each of these

approaches has a one-mile-wide traffic lane established on each side of the separation zone. The Harbor Safety Plan for the POLB/POLA defines the Precautionary Area as "the waters enclosed by a line connecting Point Fermin Light (33-42.3N, 118-17.6W) along the shoreline to the San Pedro breakwater and the middle breakwater (following the Convention on the International Regulations for Preventing Collisions at Sea demarcation lines) to Long Beach Channel entrance light "2" (33-43-4N, 118-10.8W) southeast to 33-37.7N, 118-06.6W; southwesterly to 33-35.5N 118-08.8W; west to 33-35.5N, 118-17.6W; and north to the point of origin" (MXSOCAL 2001). SONGS is about 28 miles outside of the Southern TSS Inbound Course (NOAA 2017c; MXSOCAL 2001). The Southern TSS inbound course is the eastern traffic approach lane into the Precautionary Area.

4.13.2.1 Proposed Offshore Traffic

The offshore work site is roughly 36 miles east of the Precautionary Area. For security purposes, an Exclusion Area Boundary (EAB) area is established around SONGS (Figure 4.13-2).[54],[55]

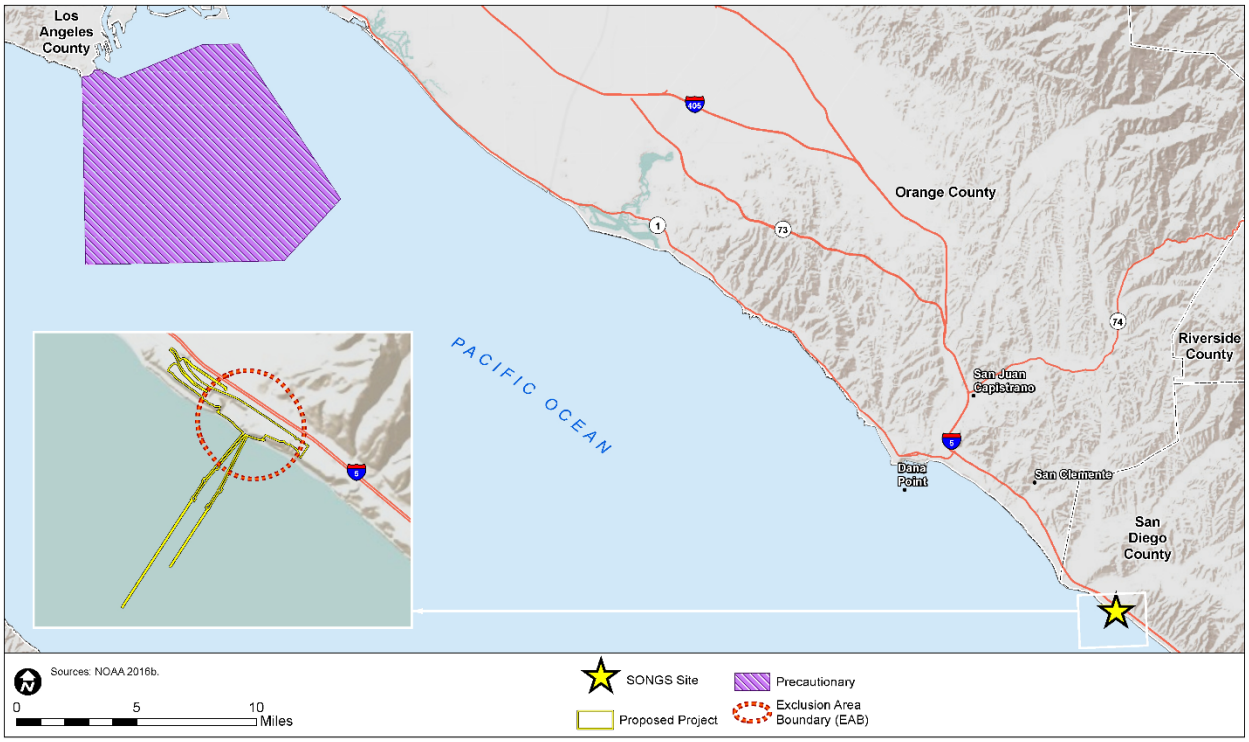
Transient ocean activities, such as boating, fishing, swimming, surfing, and paddle boarding can pass through the EAB. Vessels required for the Applicant's proposed final dispositioning of the SONGS Units 2 and 3 offshore conduits include one tugboat, one derrick barge, one workboat, one crew boat, and one materials barge (COWI 2017).

Vertical structures removed during dispositioning of the offshore conduits would be placed on the seafloor near the work area and within the area covered by the CSLC lease (temporary laydown area). The debris would be marked with temporary buoys, as needed, then loaded onto a barge with a high-capacity crane for transport to the POLB, as was done for the SONGS Unit 1 conduit dispositioning. A push boat would be used to maneuver the barge at the Proposed Project site (SCE 2016a). The Proposed Project would require an estimated one round-trip barge trip between the ~~o~~Offshore ~~s~~Site and the POLB, supported by a tugboat for mobilization/demobilization and for towing the loaded barge to the POLB (SCE 2016a). The destination for waste materials transported by barge would not be known with certainty until the Conduit Work Plan is prepared (SCE 2016a – DR #1-53). See Section 2.3.6.4, *Offshore Dispositioning Approach*, for additional information.

[54] The EAB is roughly formed by two semicircles with radii of 1,967.5 feet each, centered on the Unit 2 Containment dome and a point 134 feet southeast of the Unit 3 Containment dome, with a tangent connecting the landward arcs and seaward arcs of the two semicircles.

[55] With a reactor accident no longer possible, the EAB theoretically could be modified (reduced) to a size and shape that would satisfy 10 CFR section 72.106 for an ISFSI "Controlled Area." Per this regulation, the minimum distance from the SNF to the nearest boundary of the controlled area must be at least 100 meters. Any change to the existing EAB once all SNF is in the Approved ISFSI would require a submittal to the NRC for a license amendment. SCE does not currently plan to reduce the EAB given the need to allow for potential relocation of the Approved ISFSI to other areas on the SONGS site, as contemplated under the 2015 CCC Coastal Development Permit for the Holtec portion of the Approved ISFSI. Reducing the EAB could limit the available locations for a relocated ISFSI. (SCE 2018j – DR#7-8)

Figure 4.13-2. Exclusion Area Boundary



4.13.3 Regulatory Setting

Relevant federal and state laws, regulations, and policies that pertain transportation and traffic are summarized in Appendix A. Additional relevant information related to Caltrans, as well as regional and local plans and policies, are provided below.

4.13.3.1 California State Rail Plan (CSRP)

Caltrans Division of Rail completed the most recent California State Rail Plan (CSRP) in 2013. The CSRP establishes a statewide vision and objectives, sets priorities, and develops implementation strategies to enhance passenger and freight rail service (Caltrans 2013a). The CSRP uses 2020 as a 5-year horizon, 2025 as a 10-year horizon, and 2040 as a 20-year horizon. This 2040 horizon coincides with the analysis horizon of the California Transportation Plan and many of California's Regional Transportation Plans. The CSRP provides a comprehensive listing of long-range investment needs for California's passenger and freight infrastructure and supports the State's goal of developing an integrated, multimodal transportation network.

Key objectives of the CSRP freight rail element are to provide for the efficient movement of freight while reducing energy consumption and highway congestion by reducing truck traffic and ensuring the freight system operates in coordination and cooperation with the passenger rail system. The CSRP acknowledges existing constraints within the rail

system that impact operational efficiencies and identifies improvements needed that would enhance capacity and system performance for both freight and passenger trains.

4.13.3.2 LOSSAN Corridor Strategic Implementation Plan

The LOSSAN Corridorwide Strategic Implementation Plan, adopted by the LOSSAN Rail Corridor Agency (2012) identifies the vision for the LOSSAN corridor with an emphasis on intercity passenger rail service. Goals include the development of infrastructure needed to allow more peak period trains, faster through-express trains, and additional service improvements to meet current and future conventional and high-speed intercity, commuter, and freight demands both north and south of Los Angeles Union Station. As referenced, the plan focuses on improving passenger rail service. There are no specific elements addressing freight rail or use of the LOSSAN corridor for services other than passenger movement.

4.13.3.3 Regional and Local Roadways

At the regional and local levels, the roadway network within the study area is within the jurisdiction of Caltrans District 11 and the County of San Diego. These agencies are responsible for the operation and maintenance of the study area roadways. Any repairs to the roadway network needed to facilitate movement of construction vehicles would be subject to approval by the responsible public agency, and any construction work within the right-of-way of any public roadway would require the issuance of an encroachment permit by the responsible agency. Additional details are presented below.

Regional planning for the Proposed Project area is conducted by the San Diego Association of Governments (SANDAG), which is the designated Metropolitan Planning Organization and Transportation Management Agency for the San Diego region. SANDAG is responsible for preparing the Regional Transportation Plan and Regional Transportation Improvement Program (RTIP). *San Diego Forward: The Regional Plan*, San Diego region's long-range transportation plan and Sustainable Communities Strategy, addresses transportation planning requirements through 2050. This plan meets the requirements of 23 CFR Part 450.320 by incorporating the following federal congestion management process: performance monitoring and measurement of the regional transportation system, multimodal alternatives and non-single occupancy vehicle analysis, land use impact analysis, the provision of congestion management tools, and integration with the RTIP process.

California State Proposition 111, passed by voters in 1990, established a requirement that urbanized areas prepare and regularly update a Congestion Management Program (CMP). The requirements within the state CMP were developed to monitor the performance of the transportation system, develop programs to address near-term and long-term congestion, and better integrate transportation and land use planning. SANDAG provided regular updates for the state CMP from 1991 through 2008. In October

2009, the San Diego region elected to be exempt from the state CMP and, since this decision, SANDAG has been abiding by 23 CFR Part 450.320 to ensure the region's continued compliance with the federal congestion management process. The Traffic Impact Analysis prepared for the Proposed Project satisfies the state CMP requirements by addressing Proposed Project-specific traffic and transportation impacts.

Transportation planning and management in unincorporated San Diego County must be consistent with the Mobility Element of the County of San Diego General Plan. The Mobility Element provides goals and objectives for the County's transportation system and establishes a hierarchy of roadway classifications with specific functions and geometric standards for each category (County of San Diego 2011). The General Plan addresses vehicular travel as well as alternative modes of transportation such as public transit, aviation, freight rail, bicycles, and pedestrians. Old Pacific Highway as described in this section, meets the classification requirements of a "Community Collector with Intermittent Turn Lane" (2.1C) as defined in the Mobility Element (County of San Diego 2011, Table M-1b). Old Pacific Highway is not listed as a Mobility Element roadway in the San Diego General Plan.

4.13.4 Significance Criteria

The significance criteria used to evaluate the Proposed Project impacts to transportation and traffic are based on Appendix G of the State CEQA Guidelines. According to Appendix G of the State CEQA Guidelines, a significant impact would occur if the Project would:

- Increase the volume-to-capacity ratio (V/C) or result in a significant decline in intersection LOS that would exceed the adopted standards of the County of San Diego or Caltrans
- Add traffic to a roadway that has design features (e.g., narrow width, roadside ditches, sharp curves, poor sight distance, inadequate pavement structure) or accommodates uses that would be incompatible with substantial increases in traffic (e.g., use of roads for public recreational access or heavy pedestrian/bicycle use) resulting in potential safety problems
- Substantially affect scheduled passenger rail service or freight access to existing rail corridors
- Create an unsafe situation or necessitate a new traffic signal or major revisions to an existing traffic signal
- Create a safety hazard to motorists, bicyclists, or pedestrians, inadequate emergency access, or noticeable deterioration of pavement or roadway surfaces or rail infrastructure results from Project implementation
- Reduce the existing level of safety for navigating vessels or increase the potential for marine vessel accidents

4.13.5 Environmental Impact Analysis and Mitigation

Proposed Project traffic and transportation impacts focus on heavy construction vehicle trips. Employee trips associated with current operations at SONGS, which include construction staff for the Independent Spent Fuel Storage Installation, and the number of construction worker and vendor trips for the Proposed Project are expected to be similar (approximately 750 trips per day [see Section 2.3.8, *Decommissioning Waste Volumes and Disposal Sites*]). These trips were reflected in the traffic counts performed in November 2016 at study area intersections. Thus, construction worker and vendor trips are assumed to be part of baseline traffic operations.

The impact evaluation presented herein focuses on daily truck trips projected to occur in 2024 of the Proposed Project, which is when the highest cumulative number of D&D truck trips hauling waste material to disposal sites and backfill import truck trips are projected. Information presented herein was obtained from the Traffic Impact Assessment provided for reference in Appendix I and related data derived from Appendix E (Air Quality Calculations). Table 4.13-6 at the end of this section summarizes the potential impacts related to transportation and traffic, and any mitigation or Applicant-proposed measures (APMs) recommended to reduce impacts to a level that is less than significant.

ENVIRONMENTAL IMPACT ANALYSIS

Impacts of the proposed Project and recommended mitigation measures (MMs) are examined in this section.

Impact TR-1: Reduction of Local Transportation and Circulation.

Traffic generated by D&D activities could result in short-term adverse impacts on local transportation and circulation **(Less than Significant).**

Impact Discussion

D&D Truck Trips

Table 4.13-5 shows the projected number of annual and daily truck trips generated from D&D activities and the estimated number of truck trips needed to import backfill material. D&D waste hauling trips are projected to begin in 2019 and extend through 2025. Backfilling operations are expected to begin in 2022 and extend through 2025. The trip assumptions assume no beneficial reuse of concrete or recycling, resulting in an average of 4,587 waste hauling truck shipments annually (see Table 2-8). The highest peak/worst-case year for D&D waste truck traffic is 2023 during which 8,242 truck trips are projected to occur (see Table 4.13-5). Most trips (8,124) would occur between SONGS and the La Paz, Arizona, disposal site. Total daily trips were calculated assuming 260 work days per year. In 2023, 32 daily waste hauling trips would occur (see Table 4.13-5).

The peak traffic year for all truck trips would be 2024 when the highest number of cumulative waste hauling and backfill import trips would occur. As shown in Table 4.13-5, 29 daily waste hauling trips and 36 daily backfill import trips would occur in 2024, for a combined total of 65 daily truck trips, which is the highest number of cumulative trips.

Table 4.13-5. Estimated Truck Trips

	Total	2019	2020	2021	2022	2023	2024	2025
Estimated Waste Hauling Annual and Daily Truck Trips								
Annual Truck Trip %	100%	1.3%	3.2%	21%	20%	26%	23%	5.9%
La Paz, AZ	31,650	402	1,022	6,603	6,448	8,124	7,178	1,873
Clive, UT	366	5	12	76	75	94	83	22
Andrews, TX	95	1	3	20	19	24	22	6
Total Annual	**32,111**	**408**	**1,376**	**6,699**	**6,542**	**8,242**	**7,283**	**1,901**
Total Daily	**--**	**2**	**5**	**27**	**25**	**32**	**29[1]**	**7**
Estimated Backfill Material Volumes, Truck Loads, and Daily Trips								
Cubic Yards					32,000	40,000	130,000	30,000
Cubic Yards/Load					14	14	14	14
Truck Trips					**2,286**	**3,557[2]**	**9,286**	**2,143**
Daily Truck Trips					**9**	**14**	**36**	**8**

Source: Obtained from Appendix D1.
Notes:
[1] One daily trip was added to the total to capture trips to Clive, UT, and Andrews, TX.
[2] Includes 2,857 backfill material hauling trips, plus 700 concrete slurry trips that only occur in 2023.

Impacts to LOS at the study area intersections during 2024 are shown in Table 4.13-4 (see above) and discussed in the Traffic Impact Analysis provided in Appendix I. For comparative purposes, LOS associated with baseline conditions is shown and, as noted, does not exceed the minimum standards established by Caltrans or the County of San Diego. In 2024, the peak traffic year, the LOS would only change from existing conditions for the Basilone Road/I-5 SB Ramps intersection during the AM peak hour (from LOS B to C) and for the SONGS South/Old Pacific Highway intersection during the AM peak hour (from LOS A to B). Delay times would be negligibly increased; however, the Proposed Project would not degrade the LOS at any of the study intersections to below the acceptable standard. Construction traffic associated with the Proposed Project would have a less-than-significant impact on traffic operations at the study area intersections.

Operation-Related Trips

As discussed in Section 2.0, *Project Description*, the Applicant has applied to the CSLC requesting a new lease (current CSLC Lease is No. PRC 6785.1) to cover the anticipated SONGS Decommissioning period (2019 to at least 2035). No development or reuse plans are proposed for the subject property; thus, no operational traffic volumes associated with subsequent redevelopment of the site have been estimated.

Although impacts are less than significant, SCE commits to implementing APM-19 and APM-20 to ensure that impacts associated with traffic would be further reduced (see Table 4-2, *Applicant-Proposed Measures*).

APM-19: Emergency Services Access. The Applicant or its contractor shall coordinate with U.S. Marine Corps Camp Pendleton, San Diego County, and the City of San Clemente prior to road/lane closures to ensure that Proposed Project activities and associated road and lane closures would not significantly affect emergency response vehicles.

APM-20: Oversize/Overweight Loads. Prior to the first transport of an oversize/overweight load, the Applicant ~~and/~~or its contractor shall coordinate with the California Department of Parks and Recreation to establish protocols to ensure that equipment, components, and materials, including heavy haul loads, being transported to/from the site as part of the Proposed Project via Basilone Road (Old Pacific Highway) and across associated bridges (San Onofre Creek and Railroad Overhead) would not exceed established limitations or safe operating conditions.

Mitigation Measure

MM REC-1b would also further reduce this less-than-significant impact associated with traffic and public access to areas adjacent to the Proposed Project.

MM REC-1b: Public Access Plan (*Section 4.12, Recreation and Public Access*).

Impact TR-2: Reduce Pedestrian and Bicycle Rider Safety.

Construction vehicles could result in short-term adverse impacts on pedestrian and bicyclist safety **(Less than Significant with Mitigation).**

Impact Discussion

The Proposed Project would not require modifications to existing County roads or state highways to accommodate D&D vehicles. The roads currently accommodate heavy trucks and large vehicles. There are no existing design features that would compromise the operational safety of construction vehicles. As shown above, during the heaviest year (2024) of construction traffic, the Proposed Project would generate 65 construction trips per day. Over a 10-hour work day, this would equate to six to seven truck trips per hour (assuming they are evenly spaced out). Construction volumes would not significantly affect roadway operations, as discussed above under Impact TR-1 nor do conditions exist that would affect the safety of vehicles operating along Old Pacific Highway and at the Basilone Road/I-5 interchange.

The Proposed Project may temporarily require the closure of segments of Old Pacific Highway, the bicycle route, and road shoulders adjacent to SONGS, for construction personnel or equipment to access the site (see Section 4.12, *Recreation and Public*

Access). As noted, pedestrian use of the road shoulders near SONGS is minimal. Because Old Pacific Highway is part of a designated bicycle route, temporary closures have greater potential to adversely affect bicyclists. SCE commits to implementing APM-21 to minimize impacts to pedestrian and bicycle rider safety.

> **APM-21: Pedestrian and Bicycle Access and Safety.** To minimize impacts associated with temporary access to local sidewalks or other pedestrian or bicyclist rights-of-way, the Applicant or its contractor shall coordinate with the California Department of Parks and Recreation to ensure that appropriate steps are taken to ensure continued pedestrian and bicyclist access and safety. Steps may include providing alternative access paths, signage, and advance notification.

With implementation of APM-21, the impact related to pedestrian and bicycle rider safety would be reduced; however, not to a less-than-significant level.

Mitigation Measures

MM REC-1a, Public Notification, detailed in Section 4.12, *Recreation and Public Access*, would require warning signs be posted notifying bicyclists of road closures and the location of detours. With implementation of this MM, potential impacts to bicycle and pedestrian safety would be reduced to a less-than-significant level.

Impact TR-3: Limit Rail Operations.

The use of rail service to dispose of D&D waste material could adversely affect operation of the LOSSAN and Transcontinental corridor **(Less than Significant).**

Impact Discussion

The Applicant has estimated that up to 56 rail shipments would occur annually (see Table 2-8). Assuming a 260-day work year, this would equate to one rail shipment every 4 to 5 days. All rail cars transporting D&D waste from SONGS would be hauled to the Stuart Mesa Railyard in Oceanside. These rail cars would then be combined with larger BNSF trains for transport to the identified disposal locations (described above).

As discussed in the California State Rail Plan, the LOSSAN segment south of Fullerton to San Diego will become one of the highest volume lines in California, with more than 75 daily trains by 2025. Train volumes on the TRANSCON route and other transcontinental corridors are expected to experience a large increase in freight train volumes (Caltrans 2013a). There are no specific performance thresholds for rail service, rather freight and passenger rail planning is prioritized based on existing and proposed volume within rail segments. Track segments with a total daily count over 30 trains require a balance between freight and passenger traffic and additional coordination between rail operations to ensure service efficiencies are maintained or improved (Caltrans 2013a).

The Proposed Project would generate between five and 15 cars per shipment and as described above, rail cars would be hauled from SONGS to the Stuart Mesa Railyard and then combined with other BNSF freight trains. From there, the rail cars would likely be transported north and then east to the San Bernardino Intermodal Yard, and then on to a disposal location in Clive, Utah or Oak Ridge, Tennessee. To avoid conflicts between passenger and freight trains on shared use corridors, freight trains operate at night after passenger service has terminated for the day and before it begins the next morning. This is typically between 11:00 p.m. and 4:00 a.m. the next morning.

The Proposed Project would not generate demand for additional freight trains. The movement of D&D waste rail cars would be coordinated with BNSF and combined with planned train sets. The Proposed Project is not expected to require additional trains; thus, it would not adversely impact freight or passenger operations on either the LOSSAN or TRANSCON corridors. Overall, the Proposed Project would have a less-than-significant impact on rail operations.

Mitigation Measures

No MMs are recommended for Impact TR-3.

Impact TR-4: Reduce Driveway Safety or Require New Traffic Signals.

D&D traffic could adversely affect driveway safety or require a new traffic signal **(Less than Significant).**

Impact Discussion

The SONGS facility has two exit/entrance driveways providing vehicle access from Old Pacific Highway. The Proposed Project would not adversely affect LOS at the north entrance but would reduce the LOS from A to B at the south entrance (see Table 4.13-4, above). This is considered an acceptable level; thus, movement of D&D traffic would not require installation of a new traffic signal at one or both intersections. The driveways have existing security stations and gates. Vehicles would check in/out when arriving or leaving the site. This would regulate traffic flow and maximize safety for workers, truck drivers, and bicyclists in the area. Thus, safety impacts would be less than significant.

Mitigation Measures

No MMs are recommended for Impact TR-4.

Impact TR-5: Reduce Marine Vessel Safety.

Proposed Project activities could reduce the existing level of safety for navigating marine vessels **(Less than Significant).**

Impact Discussion

As discussed in Section 2.0, *Project Description,* a Dredging Plan would be developed before any dredging activities begin (see APM-15). The Dredging Plan would include methods and safety protocol for conducting dredging activities consistent with U.S. Army Corps of Engineers, California State Lands Commission, California Coastal Commission (CCC), and Regional Water Quality Control Board requirements.

In addition, a Conduit Work Plan (APM-9) would be prepared to detail how offshore structures would be removed (using divers, barges, and tug boats). Vertical structures removed during dispositioning would be placed on the seafloor near the work area and within the temporary laydown area covered by the CSLC lease. The debris would be marked with temporary buoys and loaded onto material barges using a high-capacity crane for transport to the POLB. SCE commits to the preparation of a Dredging Plan, Conduit Work Plan, and, if necessary, obtaining a permit from the U.S. Coast Guard for Private Aids to Navigation to ensure that impacts to marine vessel safety would be minimized. The APMs applicable to marine vessel safety are identified as follows:

APM-9: Conduit Work Plan (Section 4.4, *Biological Resources*).

APM-15: Dredging Plan (Section 4.9, *Hydrology and Water Quality*).

APM-18: Notification to Local Mariners (Section 4.12, *Recreation and Public Access*).

APM-22: Private Aids to Navigation. If required, the Applicant ~~and/~~or its contractor shall obtain or update a permit from the U.S. Coast Guard for Private Aids to Navigation prior to the start of offshore activities. The permit shall include any buoys or other markers used as part of the Proposed Project and appropriate methods to install and maintain said markers.

Implementation of APM-9, APM-15, APM-18, and APM-22 would reduce impacts associated with marine vessel safety to less-than-significant.

Mitigation Measures

No MMs are recommended for Impact TR-5.

4.13.6 Cumulative Impacts

As discussed in Section 3.2, *Relevant Cumulative Projects*, and shown in Table 3-2, 21 reasonably foreseeable cumulative projects fall within the geographic area near SONGS considered for potential cumulative impacts related to transportation and traffic. None of these projects would induce substantive long-term population growth (e.g., they would not involve new, large residential, or mixed-use developments); and thus, would not result in a significant increase in traffic using study area intersections. The Proposed Project

would not have any significant or adverse traffic or transportation impacts, nor would it contribute to significant or adverse long-term cumulative traffic conditions.

4.13.7 Future Activities

Implementation of Future Activities would generate traffic; however, not in the volumes projected for the Proposed Project. Offshore activities would include the removal of the solid covers on the Unit 2 discharge conduit, and if required by the Commission, removal of remaining discharge conduit diffuser ports, which would result in additional barge trips to the POLB; however, considering the Proposed Project is estimated to generate one barge round-trip, additional barge trips would be minimal. DoN approval would be required to implement any onshore Future Activities, as well as issuance of a CDP amendment by the CCC in 2035. At the time those approvals are finalized, end-state conditions for the existing transportation infrastructure would be evaluated. Until that time, no improvements to the existing transportation infrastructure is anticipated. If the DoN and CCC both determine that the transportation infrastructure improvements are needed to accommodate future conditions on the site, additional environmental evaluation would be needed to determine potential impacts and MMs, if needed.

4.13.8 Summary of Proposed Mitigation Measures

Table 4.13-6 provides a summary of the mitigation and Applicant-proposed measures.

Table 4.13-6. Traffic and Transportation Impact/Mitigation Summary

Impact	MM/APM
TR-1: Reduce Local Transportation and Circulation	MM REC-1b: Public Access Plan APM-19: Emergency Services Access APM-20: Oversize/Overweight Loads
TR-2: Reduce Pedestrian and Bicycle Rider Safety.	APM-21: Pedestrian and Bicycle Access and Safety MM REC-1a: Public Notification
TR-3: Limit Rail Operations	None recommended
TR-4: Reduce Driveway Safety or Require New Traffic Signals.	None recommended
TR-5: Reduce Marine Vessel Safety.	APM-9: Conduit Work Plan APM-15: Dredging Plan APM-18: Notification to Local Mariners APM-22: Private Aids to Navigation

4.14 UTILITIES AND PUBLIC SERVICE SYSTEMS

This section describes existing utilities and public services in the Proposed Project area, identifies applicable significance thresholds, assesses the Proposed Project's impacts to utilities and public services and their significance, and recommends measures to avoid or substantially reduce any effects found to be potentially significant.

4.14.1 Environmental Setting

For the purposes of this analysis, the study area is defined as the onshore portion of the San Onofre Nuclear Generating Station (SONGS), which is entirely within the boundaries of Marine Corps Base Camp Pendleton (MCBCP), and adjacent offshore areas in the Pacific Ocean. The 99-acre onshore SONGS site has no permanent residents. The adjacent ~~o~~Offshore ~~s~~Site covers 21 acres of tide and submerged lands, and includes the SONGS Units 2 and 3 intake and discharge conduits, associated appurtenances, and environmental monitoring buoys.

4.14.1.1 Public Services

Facility Security and Crime Prevention and Protection

Following the permanent shut-down of SONGS Reactor Units 2 and 3 (Unit 1 was previously retired), Southern California Edison (SCE) implemented the Nuclear Regulatory Commission (NRC) approved Defueled Emergency Plan in 2015 reflecting the change in the site's status to Cold and Dark and the associated reduced level of risk for a radiological emergency beyond the SONGS site boundary (see Section 2.2.2.2, *Ongoing Maintenance, Hazard Elimination, and Preparatory Activities*, and Table 2-4). Ongoing security and spent fuel management activities at the existing Independent Spent Fuel Storage Installation (Approved ISFSI) would remain in place until SNF is removed from the facility.

Similarly, security personnel and physical security requirements would continue to be maintained by SCE's highly trained on-site security force, but would evolve and be reduced as the configuration of radiological material is changed and quantities reduced or eliminated. The Federal Bureau of Investigation (FBI) is the primary law enforcement agency on the SONGS site because any criminal acts that could take place on site, including potential acts of terrorism, fall under federal jurisdiction.

Security on MCBCP property is enforced by the MCBCP Security Battalion (EDAW 2010). In general, MCBCP provides some tactical response at SONGS; however, its primary role is traffic-control related (SCE 2016a – DR #1-124). The nearest California Highway Patrol stations are in San Juan Capistrano and Oceanside, and Sheriff's Offices within 10 miles of SONGS are in San Clemente, Dana Point, and San Juan Capistrano. The U.S. Coast Guard (USCG) provides offshore protection and response along the California coastline.

The nearest USCG base is in San Pedro, within the Port of Long Beach, approximately 45 miles north of SONGS. The USCG Station closest to SONGS is approximately 24 miles north in Corona Del Mar.

Fire Prevention and Suppression

The MCBCP Fire Department has provided assistance in support of the SONGS Emergency Plan pursuant to a memorandum of agreement (MOA) since 2008 (SCE 2017a; SCE 2016i; SCE 2016a – DR #1-124). The MCBCP Fire Department provides support to SONGS in multiple areas, including fire suppression, search and rescue, and additional services as described in the MOA. The goal response time for the MCBCP Fire Department, as outlined in the MOA, is to respond within 30 minutes of notification from SONGS (SCE 2016i).

Emergency Health Care

While SONGS has onsite first-aid personnel, supplies, and equipment necessary to treat potentially contaminated or injured personnel, SCE also maintains agreements with outside support agencies that assist when called on, such as hospitals. These facilities are equipped and qualified to receive and treat contaminated or exposed persons with injuries requiring medical care (SCE 2017a). During the Proposed Project, SONGS would be supported by the medical centers in Laguna Beach and Mission Viejo (Mission Hospital Regional Medical Center), and Oceanside (Tri-City Medical Center), approximately 14 miles northwest, 15 miles north, and 20 miles south of SONGS, respectively (SCE 2017a). Mission Hospital Regional Medical Center has a combined capacity of 523 beds between two campuses and can provide 24/7 emergency, intensive, and surgical care (Mission Hospital Regional Medical Center 2017). Tri-City Medical Center has a 397-bed capacity and more than 700 physicians practicing 60 different specialties (Tri-City Medical Center 2017).

Schools

While no schools are in the immediate area of SONGS, five schools under two elementary school districts lie within the borders of MCBCP (EDAW 2010) (see Table 4.14-1).

Table 4.14-1. Schools within Marine Corps Base Camp Pendleton

School District	School	Location	Distance from SONGS
Fallbrook Union Elementary	Mary Fay Pendleton Elementary	Oceanside	14.9 miles
	San Onofre Elementary	San Clemente	1.8 miles
Oceanside Unified	North Terrace Elementary	Oceanside	14.8 miles
	Santa Margarita Elementary	Oceanside	14.1 miles
	Stuart Mesa Elementary	Oceanside	11.8 miles

Sources: EDAW 2010; Mary Fay Pendleton Elementary 2016; San Onofre Elementary 2016; North Terrace Elementary 2016; Santa Margarita Elementary 2015; Stuart Mesa Elementary 2014.

These five schools serve approximately 3,439 students between kindergarten and eighth grade, primarily the dependents of MCBCP residents. High school students living within MCBCP primarily attend schools in the Capistrano Unified School District, Fallbrook Union High School District, or Oceanside Unified School District.

Parks

While the SONGS Onshore ~~s~~Site is located entirely within the boundaries of MCBCP, it is bordered on the south side by a portion of San Onofre State Beach, one of the top five most-visited State parks in California and a popular destination for surfers and campers (DPR 2017b; see Section 4.12.1.2, *San Onofre State Beach*). For a more in-depth description of the State Park and other recreation facilities and activities surrounding the SONGS site, see Section 4.12, *Recreation and Public Access*.

4.14.1.2 Utility Systems

Various easements for public utilities and access roads are located throughout MCBCP and the SONGS site. These include power lines, telephone lines, cell phone towers, fiber optic cables, pipelines, and associated support facilities.

Electricity and Natural Gas

As the SONGS site is currently classified as Cold and Dark (see Section 2.2.2.2, *Ongoing Maintenance, Hazard Elimination, and Preparatory Activities*), power is brought in from off-site. Electrical and natural gas utility systems at SONGS are provided by Sempra Energy via San Diego Gas and Electric (EDAW 2010).

Wastewater

Wastewater currently generated by SONGS is primarily processed on site. The existing SONGS wastewater treatment plant is located at the site's the North Industrial Area, and includes two package plants that run 24 hours per day, 7 days per week, with a combined throughput of 50,000 gallons per day at full capacity. The wastewater treatment plant operates under waste discharge requirements identified in the National Pollutant Discharge Elimination System (NPDES) permit issued by the San Diego Regional Water Quality Control Board (RWQCB), which specifies that the discharge of wastewater must have a 10:1 dilution flow at the outfall. Preliminary wastewater treatment consists of a grinder and flow equalization. The secondary treatment is extended aeration, secondary clarification, and acidity adjustment. Management of solids is accomplished via aerobic digestion with a final disposition in an off-site landfill. The flow rate of the wastewater treatment plant as of July 2016 was an average of 6,000 gallons per day, with a maximum allowable daily discharge of 14,000 gallons per day (SCE 2016a – DR #1-125). By the middle of the Proposed Project, when the discharge conduits are no longer needed,

sewage is expected to be diverted to a holding tank and periodically serviced by an outside vendor (SCE 2016a – DR #1-26).

As a component of its wastewater facility, the SONGS site also contains two oil/water separators. This equipment collects oily wastewater from all site wastewater-generating operations. Oil is pumped from the separator into either a 1,200-gallon tank or 55-gallon drums pending characterization and preparation for offsite disposal. The water is then pumped for further processing in the wastewater treatment plant.

As part of the decommissioning process, water from the decommissioned structures, systems, and components (SSCs), including radiological buildings, would be processed and tested before disposal. This would include any water collected from draining systems, floor drains, pumping sumps, and the water pumped from the spent fuel pools and refueling pools. Processing all radioactive water is a precursor to the removal of the wastewater treatment plant (SCE 2016c) and would likely be performed using skid-mounted, temporary water processing systems brought on-site (see Section 2.2.3.8, *Water Processing*). These systems typically include mechanical filtration, charcoal filters, and ion exchange resin beds. Once water is processed, sampled, and determined to meet SONGS Offsite Dose Calculation Manual (NUREG-1301 [NRC 1991]) and RWQCB conditions, the treated water would be discharged through one of the SONGS Units 2 and 3 discharge conduits in accordance with the existing or an amended SONGS NPDES permit.

Water Supply

SCE currently has a contract with the South Coast Water District's Joint Regional Water Supply System to supply SONGS with potable water. Water delivery notifications are provided by the San Diego County Water Authority via Municipal Water District of Orange County at Metropolitan Water District service connection CM-10 (SCE 2016a – DR #1-128). Post-operation, the SONGS potable water use has decreased notably. The usage between April and October 2017 averaged 2.9 acre-feet per month (SCE 2018b – DR #5-6). No ground water is withdrawn from directly beneath the SONGS site for drinking water purposes.

During the Proposed Project, the total water usage to support decommissioning activities is estimated to be approximately 313 acre-feet (102 million gallons), including 238 acre-feet (77.5 million gallons) for dust suppression, 72 acre-feet (23.5 million gallons) for potable water use, sanitary systems, and fire protection, and 3 acre-feet (1 million gallons) to fill both reactor cavities in preparation for reactor vessel segmentation work (SCE 2018a; SCE 2018c; see Table 2-9 in Section 2.0, *Project Description*). The water would be purchased from the South Coast Water District; however, as noted in Section 2.3.10~~3~~, *Water Use and Power Supply*, when practicable, rain and stormwater collected in on-site sumps could also be used for dust control (SCE 2016a – DR #1-26).

On-site water services would continue to be needed at SONGS during decommissioning and at the Approved ISFSI. The security building, which includes a bathroom facility, is designed to accommodate 17 people during regular business hours and a minimum of three people continuously (24 hours per day, 7 days per week).

Solid Waste Management

As shown in Table 2-8, *Estimated Proposed Project Waste Volumes and Shipments*, decommissioning and removal of the SONGS SSCs is expected to generate multiple types of wastes, including radioactive and non-radioactive waste (see Section 4.1, *Hazardous and Radiological Materials* for a discussion of low- and high-level waste disposal requirements). Non-radioactive materials constitute the bulk of the waste that would be generated, totaling 18,765,735 cubic feet (12,606,135 cubic feet of non-radioactive debris and 6,159,600 cubic feet of non-radioactive metals). The primary conventional ("clean") waste would be waste concrete and rubble generated from demolition of SSCs. Other solid wastes would include:

- Universal wastes such as batteries, paints, pesticides, or bulbs
- Scrap metals, rubber, plastic, glass, carpet, insulation, and masonry products
- Packaging materials including wood, paper, and plastic
- Construction wastes including brick, mortar, timber, steel and metal scraps, pipe and electrical cuttings, nonhazardous equipment parts, styrofoam, and other materials used to transport and package construction materials
- Domestic wastes such as cans, cups, paper bags, plastic wrappers, and cigarettes
- Vegetation removed during re-grading

Non-radioactive decommissioning materials would be shipped to an out-of-state facility, such as La Paz County, Arizona, in compliance with Executive Order No. D-62-02 (SCE 2016a – DR #1-29a/b/c), which established a moratorium on in-state disposal of decommissioning wastes at Class III landfills and unclassified waste management units in California (California Office of Governor 2002; see Section 4.1.1.6, *Waste Management*). Due to the potential risk for radioactivity being inadvertently released from the Proposed Project by recycling activities, recycling of any material, including ferrous metals, may be limited. However, a small volume of high-value waste may be shipped to the Port of Long Beach (POLB) and recycled outside of the U.S.

4.14.2 Regulatory Setting

Relevant federal and state laws, regulations, and policies that pertain to the Proposed Project are summarized in Appendix A. As the onsite portion of SONGS is located entirely on federal land within the confines of MCBCP, no local regulations related to utilities and public service systems apply to the Proposed Project.

4.14.3 Significance Criteria

The significance criteria used to evaluate the Project impacts to utilities and public service systems are based on Appendix G of the State CEQA Guidelines. According to Appendix G of the State CEQA Guidelines, a significant impact would occur if the Project would:

- Result in the provision of or need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, to maintain acceptable service ratios, response times, or other performance objectives for emergency response services, including fire or police protection, schools, parks, or other public facilities
- Exceed the Proposed Project-related wastewater treatment discharge requirements of the San Diego RWQCB
- Exceed the capacity at the wastewater treatment facility that serves or may serve the Proposed Project's projected demand
- Surpass water supplies available to serve the Proposed Project from existing entitlements and resources
- Result in insufficient permitted solid waste disposal capacity
- Not comply with applicable federal, state, and local statutes and regulations related to solid waste

4.14.4 Environmental Impact Analysis and Mitigation

The Proposed Project would occur over an estimated 10-year period (2019 to 2028); however, to conservatively estimate the potential worst-case for impacts, a 7-year period (2019 to 2025) is used (SCE 2018c). Decommissioning activities would primarily occur on or near the Proposed Project's upland site; however, shoreline, near-shore, and offshore decommissioning activities would also occur. The analysis assesses the Proposed Project's potential to require an increase in fire protection, water supplies, wastewater treatment capacity, or solid waste capacity which may necessitate new facilities. Table 4.14-3 at the end of this section summarizes the potential impacts related to utilities and public service systems, and any mitigation and Applicant-proposed measures (APMs) recommended to reduce all impacts to a less-than-significant level.

ENVIRONMENTAL IMPACT ANALYSIS

Impacts of the proposed Project and recommended mitigation measures (MMs) are examined in this section.

Impact USS-1: New or Altered Public Services or Government Facilities.

The Proposed Project could affect emergency services including response times for fire or police protection, or affect schools or parks in a manner that would necessitate new or altered public services or government facilities **(Less than Significant Impact).**

Impact Discussion

Impacts to public service providers could occur with increases to the size of the population and geographic area served, the number and types of calls for service, or physical development, or if there is a conflict with any applicable plan, policy, or regulation of an agency responsible for providing public services that could result in capacity constraints to existing public service providers. This impact analysis evaluates if the Proposed Project would result in a substantial adverse physical impact associated with the need for new or altered governmental facilities, the construction of which could cause significant environmental impacts, to maintain acceptable fire protection and emergency response.

The purpose of the Proposed Project is to safely decommission and remove facilities associated with SONGS Units 2 and 3 and, therefore, would not increase the size of the local population, add new facilities which would require services to the region, or require that new facilities, including schools and parks, be constructed to maintain current service ratios. As described in Section 2.0, *Project Description*, the decommissioning process involves standard demolition techniques similar to other large-scale demolition projects. Since June 2013, SONGS has transitioned from operating status to shutdown status. Many hazardous materials have been removed from the operational areas of the facility, and the emergency planning (including fire response) has been adjusted to address unanticipated events for a permanently defueled facility. The risk of fire or other emergency and need for emergency response during decommissioning activities would be less than that which existed during operation of SONGS, and similar to the existing baseline. At the end of decommissioning, the potential for fire or other emergency, and level of preparedness for emergency response, would decrease with the reduced configuration and quantity of hazardous materials on-site.

The SONGS site would continue to be served by the emergency response providers identified in Section 4.14.1, *Environmental Setting*, including SCE on-site security, nearby MCBCP Security Battalion, California Highway Patrol, Sheriff's Offices, and U.S. Coast Guard (offshore). As discussed in Section 2.2.3.1, *Emergency Plans* (see also Table 2-5), SCE is currently implementing its NRC-approved Defueled Emergency Plan, which includes: (1) emergency plan staff trained to address unanticipated events for a permanently defueled facility located on-site, 7 days per week/24 hours per day; (2) on-site radiological and environmental monitoring and NRC inspections; (3) close coordination and communication with off-site partners and participation in an Interjurisdictional Planning Committee; and (4) frequent on-site emergency preparedness drills and routine fire, medical, and emergency communication drills with off-site partners.

Fire protection for the SONGS site is provided by on-site SONGS staff and the MCBCP Fire Department. The goal response time for the MCBCP Fire Department, as outlined in an existing MOA, is to respond within 30 minutes of notification from SONGS (SCE 2016i). MCBCP operates 10 fire stations within the base; Fire Station #7 is the nearest station to the SONGS site (EDAW 2010). A substantial response from fire protection personnel could be required if non-radiological hazardous conditions resulting from decommissioning activities were to combust. Flammable materials that would be used during decontamination and dismantlement of the Proposed Project include solvents, paints, cleaners, sealers, acids, hydraulic and motor oil, and diesel fuel. SCE would update or develop as part of the Proposed Project, multiple hazard prevention and response plans for the SONGS facilities (see Table 2-3), including a Waste Management Plan (Applicant-proposed measure [**APM**]**-1**), which would be developed consistent with regulatory requirements for each waste type (radiological and non-radiological), based on the evaluation of available methods and strategies to manage waste and minimize risk.

The SONGS Integrated Law Enforcement Response Plan (SCE 2015c) outlines responsibilities and response actions for multiple agencies; this Plan contains confidential safeguard information and is not available for review (SCE 2016a – DR #1-123). As noted in Section 2.3.10~~3~~, *Water Use and Power Supply*, an estimated 2.5-megawatt average power load would be required during Proposed Project activities, which is within current on-site capacity. If required, additional temporary power could be obtained from existing switchyard transformers or other on-site sources such as temporary diesel generators (these emissions are captured in the air quality assumptions).

Applicant Proposed Measures

In its APMs (see Table 4-2, *Applicant-Proposed Measures*), SCE commits to implementing the following measure to minimize impacts to utilities and public services.

APM-1: Waste Management Program (Section 4.1, *Hazardous and Radiological Materials*).

With implementation of APM-1, hazardous conditions resulting from the Proposed Project would result in a less-than-significant impact to fire risk.

Mitigation Measures

No MMs are recommended for Impact USS-1.

Impact USS-2: Exceed Wastewater Treatment Requirements or Capacity.

The Proposed Project could generate wastewater that exceeds federal or state standards or that is in excess of the wastewater treatment provider's available capacity **(Less than Significant).**

Impact Discussion

As detailed in Section 2.0, *Project Description*, the onshore area of SONGS contains a wastewater treatment plant that receives and processes wastewater from SONGS Units 2 and 3; from the Administrative, Warehouse, and Shop Building; and from the oily waste separator located in the site's Intake Structure Area. Once treated, the wastewater is discharged through the SONGS Units 2 and 3 conduits in accordance with the requirements of the NPDES permit. Processing of any water that may be radioactive would require the use of water processing systems brought on-site (see Section 2.2.3.8, *Water Processing*). These systems typically include mechanical filtration, charcoal filters, and ion exchange resin beds. The water is processed, sampled, and determined to meet SONGS Offsite Dose Calculation Manual (NUREG-1301) and RWQCB conditions. The wastewater treatment plant has sufficient permitted capacity to process all wastewater generated from the Proposed Project, and the plant's structures, systems, and components would remain in place while the SONGS Units 2 and 3 conduits are in use.

Once the conduits are decommissioned, the main producer of wastewater for the SONGS Decommissioning would be staff and activities associated with the Approved ISFSI. The estimated quantity of wastewater that could be generated during Future Activities is unknown at this time; however, quantities generated and discharged would likely be comparable to other similar-sized waste movement and decommissioning projects. After the on-site wastewater treatment facilities are removed, the Applicant would likely enter into a service agreement with a wastewater provider in the area, such as MCBCP Public Works Department or County of San Diego Department of Public Works. Therefore, impacts to wastewater treatment providers would be less than significant.

Mitigation Measures

No MMs are recommended for Impact USS-2.

Impact USS-3: Exceed Existing Water Supply.

The Proposed Project could use water resources that exceed entitlements and resources of an existing water supplier **(Less than Significant).**

Impact Discussion

As discussed in Section 4.14.1, *Environmental Setting*, SCE has a contract with the South Coast Water District's Joint Regional Water Supply System to provide SONGS with potable water. Historically, based on 2007 and 2008 water consumption, SCE averaged approximately 65 acre-feet (21 million gallons) of potable water per month for normal plant operations at SONGS Units 2 and 3 (ENERCON 2014). However, post-operations potable water use at SONGS has decreased notably, with monthly use between April and October 2017 averaging 2.9 acre-feet (0.95 million gallons) (SCE 2018b – DR #5-6).

As stated in Section 2.0, *Project Description*, during decommissioning, total water uses to support decommissioning during the 10-year Proposed Project duration is estimated to be 313 acre-feet (102 million gallons) (SCE 2018a; SCE 2018c), equivalent to a water use rate of 2.6 acre-feet (0.85 million gallons) per month. Actual annual and monthly use would vary depending on the decommissioning activities conducted, such as water needed for dust control during peak periods of demolition (2019 through 2025). SCE has service agreements with Tri-Cities Municipal Water District and South Coast Water District. The maximum allotment for the SONGS site is 119 acre-feet (39 million gallons) per month (SCE-AM 2018a); therefore, the Proposed Project would require only a fraction of the site's monthly water allotment. Therefore, sufficient water supplies would be available to serve the Proposed Project via existing entitlements and resources, and potential impacts to water services in the region would be less than significant.

Mitigation Measures

No MMs are recommended for Impact USS-3.

Impact USS-4: Exceed Landfill Capacity.

The Proposed Project could generate large quantities of waste in excess of landfill permitted capacity **(Less than Significant).**

Impact Discussion

As provided in Table 2-6 and described above in Section 4.14.1.2, *Utility Systems*, the Proposed Project is expected to generate a large quantity of solid waste such as concrete, asphalt, and scrap building materials. The Proposed Project is anticipated to generate approximately 18,765,735 cubic feet of non-radioactive waste, with concrete being the primary waste material. All non-radiological decommissioning wastes are proposed to be shipped by truck out of state to the La Paz County Landfill in Arizona in compliance with Executive Order No. D-62-02 (California Office of Governor 2002), which established a moratorium on in-state disposal of decommissioning wastes at Class III landfills and unclassified waste management units in California (see Section 2.3.8, *Decommissioning Waste Volumes and Disposal Sites*).

Due to the potential risk of inadvertent radiological releases from the Proposed Project, recycling of conventional waste would not occur. However, the Applicant has stated that a small volume of high-value metal waste that meets the NRC's unrestricted release criteria may be recycled. If metal recycling were to occur, this material would likely be sent via truck to the POLB for recycling outside of the U.S. The Applicant has confirmed that the landfills identified in Section 2.0, *Project Description* have sufficient permitted capacity for the waste generated by the Proposed Project (SCE 2018d). For conventional waste remaining within the U.S., the out-of-state facility(ies) would enter into an agreement with the Applicant on the quantities and types of waste to ensure sufficient

permitted capacity ~~is~~ remains available. Through this coordination with out-of-State waste facilities, impacts on landfills would be less than significant.

Mitigation Measures

No MMs are recommended for Impact USS-~~4~~1.

Impact USS-5: Conflict with Applicable Solid Waste Statutes and Regulations.

The Proposed Project would comply with all applicable statutes and regulations related to solid waste **(No Impact).**

Impact Discussion

The Applicant is required by the NRC and other regulatory agencies to comply with all applicable federal, state, and local regulations. As discussed in Section 1.2, *Legal and Governmental Authority*, the NRC has exclusive jurisdiction over radiological aspects of decommissioning, and the state is pre-empted from imposing any regulatory requirements concerning radiation hazards and nuclear safety. With the movement of essentially all decommissioning waste out-of-state, the Proposed Project would comply with Executive Order No. D-62-02 (California Office of Governor 2002), which established a moratorium on in-state disposal of decommissioning wastes at Class III landfills and unclassified waste management units in California (see Section 4.1.1.6, *Waste Management*), and no conflicts with statutes or regulations related to conventional solid waste would occur. No impact would occur.

Mitigation Measures

No MMs are recommended for Impact USS-5.

4.14.5 Cumulative Impacts

As discussed in Section 3.2, *Relevant Cumulative Projects*, and shown in Table 3-2, 28 reasonably foreseeable cumulative projects fall within the geographic area near SONGS considered for potential cumulative impacts related to utilities and public service systems. Several cumulative projects would involve the construction of large residential developments that could result in a need for new or altered government facilities (see Table 3-2, ID Nos. 17, 18, 28, and 31), While the impacts associated with these projects could be substantial, the Proposed Project would not contribute an impact to public services or utilities that is cumulatively considerable given that decommissioning activities would not require new facilities or alterations to existing facilities. Further, the Proposed Project would not result in a cumulatively considerable effect on existing water supply, wastewater treatment capacity, or local landfill capacity.

During implementation of the Proposed Project, decommissioning would result in a temporary increased risk of fire resulting from the presence of hazardous materials typical of large construction projects. However, the Proposed Project's contribution to these impacts would be less than significant and not cumulatively considerable. Several cumulative projects (ID Nos. 17, 18, 27, 29, and 31 in Table 3-2) could result in a slight increase in fire risk requiring a response from local emergency responders. If these cumulative projects were to require substantial fire response at the same time, a cumulatively considerable impact on emergency services could occur. However, such a scenario is unlikely and the Defueled Emergency Plan would be implemented for any Proposed Project activities at SONGS. With the implementation of required emergency plans and preparations for decommissioning activities, the Proposed Project's contribution to cumulative effects on public service systems would not be significant.

4.14.6 Future Activities

Implementation of Future Activities would require fire protection, water supply, wastewater treatment capacity, and solid waste capacity. Issuance of a Coastal Development Permit amendment by the CCC in 2035 is uncertain and additional U.S. Department of the Navy (DoN) approval would be required for implementation of Future Activities at a later point in time. At the time those approvals are finalized, end-state conditions for fire protection, water supply, wastewater treatment, and solid waste services would be evaluated. Until that time, no improvements to the existing fire protection, water supply, wastewater treatment, or solid waste services are anticipated. Additional environmental evaluation would be completed to determine potential impacts and MMs as part of the CCC and DoN approval processes. In the interim, once the conduits are plugged, the main producer of wastewater on site would be attributed to staff and activities associated with operation of the Approved ISFSI. At the time of the wastewater treatment plant removal, SONGS would likely enter into a service agreement with a wastewater provider in the area, such as MCBCP Public Works Department or County of San Diego Department of Public Works. Water, including for fire hydrants using the potable water supply line, would also continue to be needed at SONGS throughout the life of the Approved ISFSI (SCE 2016a – DR #1-26).

4.14.7 Summary of Proposed Mitigation Measures

Table 4.14-2 provides a summary of the mitigation and Applicant-proposed measures.

Table 4.14-2. Utilities and Public Service Systems Impact/Mitigation Summary

Impact	MM/APM
USS-1: New or Altered Public Services or Government Facilities	None recommended
USS-2: Exceed Wastewater Treatment Requirements or Capacity	None recommended
USS-3: Exceed Existing Water Supplies	None recommended
USS-4: Exceed Landfill Capacity	None recommended
USS-5: Conflict with Applicable Solid Waste Statutes and Regulations	None recommended

5.0 PROJECT ALTERNATIVES ANALYSIS

5.1 INTRODUCTION

As noted in Section 1.0, *Introduction*, the California State Lands Commission (CSLC), as lead agency under the California Environmental Quality Act (CEQA), is preparing this Environmental Impact Report (EIR) for the San Onofre Nuclear Generating Station (SONGS) Units 2 and 3 Decommissioning Project (Proposed Project). Section 2.0, *Project Description*, provides detailed information on the proposal by Southern California Edison (SCE), San Diego Gas & Electric Company, and the city of Riverside (collectively, Applicant) for a new State lease (the current Lease No. is PRC 6785.1) for the SONGS Unit 2 and Unit 3 offshore conduits, five navigational and environmental monitoring buoys: two navigational buoys that mark the Primary Offshore Intake Structures (POISs) and three environmental monitoring buoys used to collect data for a SONGS-related marine environmental monitoring program, and riprap along the shoreline seaward of the ordinary high-water mark. The new lease term requested would extend until 2035.

The State CEQA Guidelines (§ 15126.6, subd. (a)) require the CSLC to "describe a range of reasonable alternatives to the [Proposed Project], or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives." This section describes the screening methodology to identify reasonable alternatives, identifies alternatives eliminated from further consideration, and provides descriptions and impact analyses of each alternative considered. Section 6.5 identifies the environmentally superior alternative.

5.2 SELECTION OF ALTERNATIVES

5.2.1 Guidance on Alternatives Development and Evaluation

The State CEQA Guidelines provide the following guidance for evaluating alternatives.

- An EIR need not consider every conceivable alternative to a project. Rather, it must consider a reasonable range of potentially feasible alternatives that will foster informed decision-making and public participation. An EIR is not required to consider alternatives which are infeasible. (§ 15126.6, subd. (a).)
- The discussion of alternatives shall focus on alternatives to the project or its location which are capable of avoiding or substantially lessening any significant effects of the project, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly. (§ 15126.6, subd. (b).)
- In selecting a range of potential reasonable alternatives to the project, the lead agency shall include those that could feasibly accomplish most of the basic

objectives of the project and could avoid or substantially lessen one or more of the significant effects. Among the factors that a lead agency may use to eliminate alternatives from detailed consideration in an EIR are: (i) failure to meet most of the basic project objectives, (ii) infeasibility, or (iii) inability to avoid significant environmental impacts. (§ 15126.6, subd. (c).)

- The EIR shall include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed project. If an alternative would cause one or more significant effects in addition to those that would be caused by the project as proposed, the significant effects of the alternative shall be discussed, but in less detail than the significant effects of the project as proposed. (§ 15126.6, subd. (d).)
- The specific alternative of "no project" shall also be evaluated along with its impact. The purpose of describing and analyzing a no project alternative is to allow decisionmakers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project…. The "no project" analysis shall discuss the existing conditions, as well as what would be reasonably expected to occur in the foreseeable future if the project were not approved. (§ 15126.6, subd. (e)(1) and (2).)

5.2.2 Alternatives Screening Methodology

Alternatives to the Proposed Project were identified by the CSLC and proposed by other agencies and the public in comments on the Notice of Preparation, screened, and either retained for further analysis or eliminated as described below. The alternatives screening process consisted of the following steps:

Step 1: Define the alternatives to allow comparative evaluation.

Step 2: Evaluate each alternative using the following criteria:

- The extent to which the alternative would accomplish most of the basic objectives of the Proposed Project (see Section 1.3, *Proposed Project Objectives*)
- The feasibility of the alternative, considering factors such as site suitability, economic viability, availability of infrastructure, General/Local Coastal Plan consistency, and consistency with other applicable plans and regulatory limitations (CEQA § 21061.1 defines "feasible" as "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and technological factors")
- The extent to which the alternative would avoid or lessen one or more of the significant environmental impacts of the Proposed Project (see Table 5-1)

Step 3: Determine the suitability of the proposed alternative for full analysis in the EIR based on Steps 1 and 2 above. Alternatives considered unsuitable are eliminated, with appropriate justification, from further consideration.

For the screening analysis, the technical and regulatory feasibility of potential alternatives was assessed at a general level. The assessment of feasibility was conducted by using "reverse reason" to identify anything about the alternative that would be infeasible based on technical or regulatory grounds. CEQA does not require elimination of a potential alternative based on cost of construction and operation/maintenance. At the screening stage, potential impacts of the alternatives or the Project cannot be evaluated with any measure of certainty; however, elements of the Project that are likely to be sources of impacts can be identified.

In general, characteristics used to eliminate alternatives from further consideration included:

- Inconsistency with the Project's purpose and need
- Limited effectiveness in reducing environmental impacts
- Engineering feasibility and safety
- Permitting feasibility
- Potential for adverse effects on air quality or marine resources
- Potential for inconsistency with adopted agency plans and policies
- Feasibility when compared to other alternatives under consideration

Feasible alternatives that did not clearly offer the potential to reduce significant environmental impacts of the Proposed Project and infeasible alternatives were removed from further analysis. In the final screening step, environmental advantages and disadvantages of the remaining alternatives were carefully weighed with respect to their potential for overall environmental advantage, technical feasibility, and consistency with the Proposed Project objectives. Under both the Proposed Project and alternatives, decommissioning of SONGS would continue to be subject to the regulations and procedures of the U.S. Nuclear Regulatory Commission (NRC) for the decommissioning of nuclear generating stations and management of spent nuclear fuel (SNF). The onshore portion of SONGS will also be subject to requirements imposed by the Department of Navy (DoN), which is the landowner, for final end-state site restoration requirements. The DoN has not yet determined the acceptable final condition for the onshore SONGS site.

The State CEQA Guidelines require the consideration of a "no project" alternative and to identify, under specific criteria, an "environmentally superior" alternative. If the environmentally superior alternative is determined to be the no project alternative, the EIR must identify an environmentally superior alternative among the other alternatives (State CEQA Guidelines, § 15126.6, subd. (e)(2)).

5.2.3 Impacts of Major Concern

Resource areas of particular importance in the consideration of alternatives for this EIR include: (1) Hazardous and Radiological Materials, (2) Air Quality, (3) Biological Resources (Marine), (4) Hydrology and Water Quality, and (5) Transportation and Traffic.

As discussed in Section 4.1, *Hazardous and Radiological Materials*, implementation of the Proposed Project's established programs, processes, and procedures and Applicant-proposed measures [APMs] 1, 4, 12, 13, and 14) is devised in compliance with NRC requirements and designed to lower the probability that exposure to radioactive materials would occur. Nonetheless, there is an inherent risk of radiological exposure at any facility where hazardous radiological materials are present that can never be fully eliminated; therefore, impacts HAZ-1, HAZ-2, and HAZ-3 would remain significant and unavoidable.

As discussed in Section 4.3, *Air Quality*, Implementation of the Proposed Project would result in a significant impact under Impact AQ-3. While APM-3, and mitigation measures (MMs) AQ-3a and AQ-3b would help reduce the Proposed Project's oxides of nitrogen (NO_X) emissions, those emissions, specifically the daily NO_X emissions within the South Coast Air Quality Management District, would remain above the screening-level emissions threshold and Impact AQ-3 would remain significant and unavoidable.

Section 4.4, *Biological Resources*, analyzes potential direct impacts of the Proposed Project on terrestrial resources, such as clearing or trampling of vegetation, loss of breeding sites and habitat, disturbance to wildlife from construction or demolition of structures, and mechanical crushing of animals or their burrows by vehicles or equipment. In addition, indirect biological resource impacts from the Proposed Project could include the disruption of native seed banks, disruption of prey base or increased predation through alterations of the physical landscape from Proposed Project features, increased erosion and degradation of water quality, changes in water runoff due to alterations in topography, noise and vibration from demolition, and spread of invasive species. Excessive fugitive dust could also displace breeding birds and/or reduce photosynthetic capacity in plants over time and inhibit reproduction by physically coating reproductive structures or excluding insect pollinators. Indirect impacts of the Proposed Project on marine biological resources would include degradation of marine habitats due to stormwater runoff or other discharges and the potential for the spread of Invasive and non-native marine species; and direct impacts such as turbidity, debris accumulation, vessel collision with listed species, and increased underwater noise levels associated with offshore activities. Implementation of APMs 1, 4, 8, 9, 12, 15, 16, and 17 and MMs BIO-1a through 1c, BIO-2a through 2f, and MMs BIO-3, 4, 9, 10, 11, and 12 would reduce all potential impacts to terrestrial and marine biological resources to a less-than-significant level.

As discussed in Section 4.9, *Hydrology and Water Quality*, the Proposed Project may affect hydrology and water quality during onshore and offshore decommissioning activities if such activities discharge chemicals, debris, or sediment to surface or marine waters, or re-suspend physical or chemical materials and sediment from marine sediment within the offshore area. The Proposed Project has incorporated design measures and other best management practices (BMPs) to reduce potential direct and indirect Proposed Project-related impacts. In addition, implementation of APM-1, APM-2 and APMs 12 through 17, along with MM HAZ-6 and MMs WQ-4 and WQ-5 would reduce potential impacts related to hydrology and water quality to a level that is less than significant.

Finally, the traffic and transportation impact analysis in Section 4.13, *Transportation and Traffic*, focuses on heavy construction vehicle trips in 2024, which is when the highest cumulative number of D&D truck trips hauling waste material to disposal sites and backfill import truck trips are projected. During that time, the Proposed Project would not degrade levels of service (LOS) at any study area intersections to below acceptable standards. However, bicyclists would be affected during intermittent closures of shoulders and segments of Old Pacific Highway, which is a designated bicycle route. The Proposed Project could also reduce existing levels of safety for marine vessels during offshore structure removal. Implementation of APMs 9, 15, 18 through 22 and MMs REC-1a and REC-1b would reduce traffic and transportation impacts to a less-than-significant level.

5.2.4 Summary of Screening Results

Table 5-2 identifies potential alternatives and indicates if they were eliminated from further consideration (see rationale in Section 5.3, *Alternatives Eliminated from Further Consideration*) or are described and evaluated in detail (see Section 5.4, *Alternatives Evaluated in this EIR*).

Table 5-1. Potential Alternatives to the Proposed Project

Alternatives Eliminated from Further Consideration	• Crush Conduits in Place
	• Local Relocation of the Approved ISFSI in 2035
	• Containment Buildings as Interim Storage Facilities for SNF
	• Laser Reduction of the Isotopes in SNF
	• Retention of Spent Fuel Pools
	• Full Removal of Shoreline Structures
	• Final End-State Restoration Options
	• Future Uses for the SONGS Site
	• Accelerated Removal of SNF from SONGS
	• Alternate Sites for Disposal of SNF and Other HLW
	• In-State Disposal of Non-Radioactive Waste and Recycling
Alternatives Evaluated in this EIR	• No Project Alternative
	• Full Removal of Offshore Conduits
	• Partial Removal of Offshore Conduits
	• Full (or Partial) Removal of Onshore Subsurface Structures

5.3 ALTERNATIVES ELIMINATED FROM FURTHER CONSIDERATION

5.3.1 Crush Conduits in Place

5.3.1.1 Description

This alternative was ~~proposed~~ identified by SCE in its application to the CSLC (SCE's Conduit Alternative #4). Under this alternative, the SONGS Unit 2 and Unit 3 offshore intake and discharge conduits would be crushed in place and terminal structures would be removed. As with the Full Removal of Offshore Conduits Alternative (see Section 5.4.2), a trestle would be constructed to support work in the nearshore area. A crawler crane working from the trestle would employ a drop chisel-shaft or similar equipment to crush the conduits in place, including the fish return conduit, reducing them to rubble. Because the reinforcing steel within the conduit structures cannot be effectively removed from the concrete, it would remain exposed within the concrete rubble. Seafloor material would likely migrate into the excavated trench naturally, burying the concrete rubble and reinforcing steel over time.

For the remaining portions of the conduits, a crane barge would be used to excavate the seafloor material and riprap around the POISs and Auxiliary Offshore Intake Structures (AOISs) and remove them down to the tops of the conduits. After these structures are removed, the crane would crush the remaining conduits, diffuser ports, and manhole access port structures (MAPS), working from the offshore terminus toward the beach. Removed vertical sections would be placed on a barge and transported to the Port of Long Beach (POLB), or other appropriate facility, for recycling and disposal. The environmental monitoring and navigational buoys and their anchor chains and anchor blocks (sinkers) would be removed from the water.

5.3.1.2 Rationale for Elimination

This alternative would meet the Proposed Project objectives and may fulfill the CSLC lease requirements, which provides the CSLC with discretion regarding the end-state requirements for improvements. Additionally, there are no identified feasibility issues associated with this alternative. However, while the level of environmental impact is not fully known, this alternative would likely result in greater environmental impacts than the Proposed Project, including impacts related to air quality, biological resources, water turbidity, and water quality, due to the additional disturbance to the seafloor associated with conduit crushing and removal of vertical structures. Therefore, this alternative is eliminated from further analysis.

5.3.2 Local Relocation of the Approved Independent Spent Fuel Storage Installation in 2035

5.3.2.1 Description

The California Coastal Commission (CCC) issued a Coastal Development Permit for ~~expansion~~ the construction of the Holtec facility portion of the Independent Spent Fuel Storage Installation (Approved ISFSI) in 2015, which requires SCE to apply for an amended permit in 2035 to either remove the Approved ISFSI, keep it operating, or move it to a new location. Although not specified by the CCC, this alternative assumes that the Approved ISFSI would be moved out of the coastal zone. A relocation site for interim storage has not been identified, but the public has suggested relocating the Approved ISFSI east of I-5 in the "Mesa" area of the Marine Corps Base Camp Pendleton (MCBCP), which has existing pads and roadways and is also located on DoN land; however, other locations could be considered. The use of the Mesa area or any other location at SONGS or in another part of Camp Pendleton would require approval by both the DoN and NRC. All other aspects of this alternative would be identical to the Proposed Project.

Options for moving the SNF to a long-term repository outside of California are discussed in Section 5.3.10, *Alternate Sites for Disposal of Spent Nuclear Fuel and Other High-Level Waste*.

5.3.2.2 Rationale for Elimination

This alternative does not directly relate to Proposed Project objectives, as the objectives do not address changes to the approved storage method, storage location, or handling of SNF on-site. It is also speculative because it is completely dependent on decisions by other agencies (i.e., DoN, NRC, and CCC) and such decisions, if needed, would not occur for many years. Therefore, a clear and credible scenario for relocation of the Approved ISFSI is not known. Furthermore, building a new Approved ISFSI and relocating the SNF to that facility would involve impacts that would not occur under the Proposed Project, resulting in greater environmental impacts associated with building a new Approved ISFSI and additional handling and transport of SNF. While it might be argued that a new location may be safer than the existing location by moving the ISFSI further from the coast, the Approved ISFSI in its current location is part of baseline conditions. Therefore, such an alternative would mitigate hazards associated with existing conditions rather than reducing a Proposed Project impact. It is not appropriate under CEQA to consider an alternative that focuses on reducing impacts of baseline conditions rather than Proposed Project impacts. Regarding the Mesa site, whether the Mesa would be available to accommodate a relocated ISFSI in 2035 is not known. This decision would need to be made by the DoN as the landowner and approved by the NRC. Therefore, relocation of the Approved ISFSI as an alternative is eliminated from further analysis.

5.3.3 Containment Buildings as Interim Storage for Spent Nuclear Fuel

5.3.3.1 Description

During the scoping process, it was suggested that the existing SONGS Unit 2 and Unit 3 reactor containment buildings could be used for interim storage of SNF, since they are designed to prevent the release of radioactivity into the environment. Under this alternative, the containment buildings would remain on-site and repurposed as interim storage facilities for SNF. All other aspects of this alternative would be identical to the Proposed Project.

5.3.3.2 Rationale for Elimination

This alternative is not consistent with the Proposed Project objectives, which call for demolition of the containment buildings and other plant facilities. Additionally, the Proposed Project objectives do not include changes to the approved SNF storage method or on-site storage location. The feasibility of this alternative is also questionable for a variety of practical and regulatory reasons, as discussed below.

The design of any SNF storage facility must protect workers, the public, and the environment, present and future, from the harmful effects of radiation exposure from all sources. The NRC authorizes construction and operation of ISFSIs by general and specific licenses. A general license is created by regulation and confers the right upon the general licensee to proceed with the licensed activity without further review or approval by the NRC. SCE has opted for use of a general license for the construction and operation of the existing Approved ISFSI (inclusive of AREVA and Holtec facilities) ~~and the ISFSI expansion~~. The~~se facilities are~~ ISFSI is based on standardized designs and structures, systems, and components (SSCs) that have already been approved by the NRC. The approved off-the-shelf designs and SSCs used in ISFSIs is subject to NRC general licensing requirements, have been shown to provide this protection and were selected for use at SONGS.

The AREVA facility portion of the Approved ISFSI for SONGS is already licensed and in use, and the Holtec facility portion of the ISFSI ~~expansion~~ is complete. ~~An~~ The NRC-licensed AREVA facility portion of the ISFSI was constructed on a portion of the site previously occupied by reactor facilities during Unit 1 decommissioning. The ~~ISFSI~~AREVA facility holds 63 Advanced Horizontal Storage Modules (AHSM), in which 51 Dry Storage Canisters (DSCs) have been installed to date. Fifty DSCs contain irradiated fuel and one contains Greater-Than-Class-C (GTCC) waste. Eighteen of the fuel storage modules are derived from the decommissioning of Unit 1 (17 DSCs with spent fuel and 1 with GTCC waste) and the remaining 33 DSCs contain SNF from Units 2 and 3. The ~~expanded ISFSI~~Holtec facility portion of the Approved ISFSI, which was ~~recently~~ completed in January 2018, is a HI-STORM UMAX underground storage facility for storage of 2,668 used fuel assemblies in MPC-37 multi-purpose canisters.

A specific license, by contrast, requires an application to perform the licensed activity, and NRC review and approval to proceed. The use of the containment buildings as part of the Approved ISFSI has not been previously approved by the NRC and would require SCE to obtain a specific license based on a site-specific design, using customized SSCs to work within the buildings. Any alternative ISFSI design must meet the same radiation protection requirements, making it unlikely that there would be an improvement in radiation protection. The licensing process would probably be time consuming and costly and could require costly engineering measures to limit worker exposures to radiation and protect the environment, particularly because the buildings themselves are contaminated. Establishing processes and controls to limit exposure would likely substantially limit worker productivity. In addition, there may not be sufficient space within the buildings to hold the necessary volume of waste. Furthermore, as the containment buildings themselves are considered radioactive waste, use of these buildings would violate the NRC's "as low as is reasonably achievable" (ALARA) principles. As defined in Title 10, Code of Federal Regulations (CFR), Section 20.1003 (10 CFR 20.1003), ALARA is an acronym for "as low as (is) reasonably achievable," which means making every reasonable effort to maintain exposures to ionizing radiation as far below the dose limits as practical.

The design and siting of an ISFSI within the containment buildings must consider the various stages in the lifetime of the proposed spent fuel storage facility (i.e., siting, design, horizontal storage construction, commissioning, operation, and decommissioning). Existing structures and the layout of areas within the buildings may prevent the development of a useable design. The design must also contain features to ensure that associated handling and storage operations are relatively straightforward and at least comparable to the Approved ISFSI ~~or the ISFSI expansion~~. As noted previously, consideration of the containment buildings for interim storage would require a site-specific license application and approval by the NRC. This process could be lengthy and delay decommissioning. Moreover, continued use of the containment buildings would prevent accomplishing a major portion of the goals of Decontamination and Dismantlement, leaving a large volume of radioactive contaminated materials above ground well beyond present Proposed Project plans. Except for the Approved ISFSI, all above-grade structures would be removed during the Proposed Project. The continued presence of radioactive contaminated materials aboveground would also mean the potential for worker and public exposure would be greater.

Security and access controls are required at spent fuel storage facilities to prevent unauthorized access by individuals and the unauthorized removal of radioactive material. Increasing the size, complexity, and number of storage areas would require additional and comparable security with proportional increases in cost. Furthermore, this alternative would not reduce Proposed Project impacts. This alternative addresses the storage of SNF on-site, which is part of baseline conditions. Therefore, such an alternative would be mitigating an existing condition rather than reducing a Proposed Project impact.

This alternative is infeasible from a regulatory standpoint, as it is highly unlikely that the NRC would issue a license to use the containment buildings for SNF storage. This alternative also would not reduce Proposed Project impacts and would result in continued visual impacts associated with the containment buildings. The storage of SNF on-site at SONGS is considered part of baseline conditions and, therefore, is not an appropriate subject to be addressed by EIR alternatives. Therefore, use of the containment buildings for interim SNF storage is eliminated from further analysis.

5.3.4 Laser Reduction of the Isotopes in Spent Nuclear Fuel

5.3.4.1 Description

During scoping, it was suggested that an alternative be considered to reduce radiation at the SONGS site, and that the potential use of technologies using lasers could, in theory, be used to transmute SNF and high-level radioactive waste (HLW). The objective of transmutation is to change (long-lived) actinides (e.g., uranium [U] and plutonium [Pu]) into fission products and long-lived fission products into significantly shorter-lived nuclides, which become radiologically innocuous in a few hundred years. Transmutation and other forms of reprocessing would not eliminate the need for storage or a waste repository, but could reduce the volume and the hazard of the waste. All other aspects of this alternative would be identical to the Proposed Project.

5.3.4.2 Rationale for Elimination

This alternative is not consistent with Proposed Project objectives, as the objectives do not include treatment of the SNF either on- or off-site. The storage of SNF on-site at SONGS is considered part of baseline conditions and, therefore, is not an appropriate subject to be addressed by alternatives.

The feasibility of this alternative is also questionable. Laser transmutation of long-lived isotopes to more stable isotopes has been demonstrated at a laboratory scale. In 2003, several researchers in the United Kingdom (U.K.) demonstrated that a laser could be used to convert (transmute) iodine-129 into iodine-128 (a short-lived isotope with a half-life of only 25 minutes) (Ledingham et al. 2003). The research team used a powerful laser focused on a gold target to generate gamma rays, which were then trained on a sample of iodine-129 to eject a neutron and create iodine-128.

Lasers have also been used to enhance the separation and enrichment of uranium isotopes in nuclear fuels. For example, the atomic vapor laser isotope separation (AVLIS) process has been used in the U.S. to more efficiently enrich uranium fuel compared to older technologies such as the use of gas centrifuges. The AVLIS process generates less radioactive waste than earlier technologies, but it is not used to treat or process SNF or other waste byproducts. However, laser isotope separation could theoretically be used as

part of a treatment process to reduce the hazards of radioactive waste, particularly long-lived waste products and fissile uranium and plutonium isotopes (Serrato 2010).

Technologies for transmuting radionuclides have been studied for several decades as a potential way to treat or process wastes to reduce long-term hazards. In most cases, the treatment technologies combine chemical reprocessing to concentrate certain radionuclides (e.g., U, Pu) for recycling or reuse in reactors. For example, in France, U.K., Japan, and other countries, U and Pu are separated from the other nuclides in SNF with yields ranging from 99.7 to 99.9 percent. The recovered uranium is re-enriched and recycled in light water reactors (LWRs), thus reducing the need for fresh uranium ore. The Pu can be used in LWRs (or even better in Fast Reactors) as mixed oxide (MOX) fuel. Fast reactors (sometimes known as Breeder Reactors) are a type of reactor in which the fission chain reaction is sustained by fast neutrons. Such a reactor does not need a neutron moderator but must use fuel that is more highly enriched in fissile material than thermal reactors such as LWRs. This approach captures a large portion of the considerable energy content of the SNF by reusing it. The minor actinides and highly radioactive fission products that remain after processing are embedded in glass for disposal in deep geologically sealed repositories. Their radiotoxicity decreases by a factor of 10 to 100 in 10,000 years. While the recycling of Pu in LWRs decreases the growth rate of Pu stocks, only the use of fast reactors specially designed to burn Pu can decrease the Pu inventory of SNF (NEA 2016).

Additional recycling of SNF in reactors could further reduce the amounts of some radiotoxic nuclides, such as Pu-239 and the long-lived fission products Tc-99 and I-129 by transmutation with neutrons (or fission, in the case of Pu-239). However, studies have found that full transmutation in a LWR would take decades, so recent research has focused on use of fast reactors (World Nuclear Organization 2017). The minor actinides (e.g., neptunium [Np], americium [Am], curium [Cm], as well as the higher isotopes of Pu), all highly radiotoxic, are also much more readily destroyed by fissioning in a fast neutron energy spectrum, where they can also contribute to the generation of power.

Current policy in the U.S. is to directly dispose of SNF and HLW without reprocessing. Although a commercial reprocessing facility was constructed and operated at West Valley, New York, (and others were constructed but not operated at Morris, Illinois, and Barnwell, South Carolina) in the 1960s and 1970s, President Carter announced in April 1977 that the U.S. would indefinitely defer reprocessing of SNF due to concerns related to nuclear proliferation. As a result, although some research and development activities have continued (largely funded by U.S. Department of Energy [DOE]), no significant progress has been made on commercial efforts to reprocess or treat nuclear waste.

In both the U.S. and internationally, research studies have identified advanced reprocessing and treatment technologies involving the separation of U, Pu, and other actinides (Np, Am, Cu) and some long-lived fission products that could be concentrated

into groups with similar nuclear or chemical properties. In theory, transmutation technologies could be designed to treat groups of similar elements that involve new advanced reactor designs, particle accelerators, or lasers. However, considerable additional research and development would be required to investigate the benefits and costs of such waste management strategies, and it would likely cost many billions of dollars and several decades to develop commercial-scale processes that could be used.

Because no transmutation technologies for SNF treatment currently exist for lasers or particle accelerators (in fact, there are no large-scale efforts to develop such technologies), this option is not considered to be technically feasible for the SNF and HLW presently stored at SONGS. Furthermore, implementation of this alternative is completely dependent on decisions by other agencies.

This alternative is infeasible from a technical and regulatory standpoint, is not consistent with Proposed Project objectives, and would not reduce Proposed Project impacts. Therefore, laser reduction of isotopes in the SNF is eliminated from further analysis.

5.3.5 Retention of Spent Fuel Pools

5.3.5.1 Description

This alternative was suggested during scoping. Under this alternative, the spent fuel pools would not be removed until SNF is moved off-site. If dry casks in which SNF is stored become compromised, the comprised casks could not be transported off-site unless repackaged in an uncompromised cask. Retaining the existing spent fuel pools would provide facilities required to support repackaging of the spent fuel into new casks. All other aspects of this alternative would be identical to the Proposed Project.

5.3.5.2 Rationale for Elimination

This alternative is not consistent with the Proposed Project objectives, and could interfere with the decommissioning and removal of the on-site facilities. The spent fuel pools are an integral part of the containment buildings, such that it may not be feasible to retain the existing spent fuel pools while also dismantling the containment buildings. The need to retain the spent fuel pools is based on speculation that they will be needed in the future because dry storage casks will be damaged and unsuitable for transport. This alternative also would not reduce any identified significant impacts of the Proposed Project. Any potential hazards associated with the storage of SNF in the Approved ISFSI would not be exacerbated by the Proposed Project. Furthermore, the feasibility of this alternative is not clear. As such, retention of spent fuel pools is eliminated from further analysis.

5.3.6 Full Removal of Shoreline Structures

5.3.6.1 Description

This alternative includes the alternative proposed by SCE in its application (Riprap Alternative #2). Full removal of shoreline structures includes full removal of all riprap armoring the beach in areas above and below the ordinary high-water mark (including portions located below the beach surface/grade) and restoring the beach to a more natural condition. In addition, the seawall and public beach access walkway would also be removed, as described under Future Activities. Riprap located below the ordinary high-water mark is within the CSLC lease area. Full removal of the riprap would require excavation of the beach, removal of the riprap, and backfill with CSLC-approved fill, as needed, to restore the beach profile.

5.3.6.2 Rationale for Elimination

This alternative is consistent with the Proposed Project objectives, but some feasibility issues have been identified. Full removal of the riprap, seawall, and public beach access walkway would restore coastal processes to a more natural, pre-SONGS condition. Bluff erosion rates would be restored, and longshore sediment transport rates would be restored. However, although the seawall is not needed to protect the Approved ISFSI from natural events, it is relied upon to function as a security barrier for the Approved ISFSI (SCE 2015d). In addition, the public access walkway is required under special conditions to CDP 6-81-330-A for Units 2 and 3, to mitigate for loss of public access due to the presence of the plant and NRC-required Exclusion Area, which encompasses the beach and shoreline seaward of the plant, and the existing riprap protects the walkway. Decisions regarding the removal of riprap above the ordinary high-water mark will be made by the DoN and CCC, and not for many years. Removal of riprap within DoN and CCC jurisdiction will be analyzed under the National Environmental Policy Act and CEQA, respectively, at the time of the Approved ISFSI removal. As such, this alternative is eliminated from further analysis.

5.3.7 Final End-State Restoration Options

5.3.7.1 Description

This alternative would consider options for physical end-state conditions at the SONGS ~~o~~Onshore ~~s~~Site after decommissioning, including the possible restoration of the site to pre-Project conditions or some other more natural condition. While no specific restoration plan is proposed for this alternative, it could involve grading, filling, and re-contouring the topography of the site and removal of existing installed site features, such as the seawall, shoreline riprap, and gunite slopes. All other aspects of this alternative would be identical to the Proposed Project.

5.3.7.2 Rationale for Elimination

This alternative does not relate to the Proposed Project objectives, which do not address end-state restoration of the DoN lands. The objectives of the Proposed Project are limited to reducing radioactivity at the SONGS site in accordance with NRC regulations, dispositioning the offshore facilities, and completing decontamination of the site (see Section 1.3, *Proposed Project Objectives*). However, this alternative would be consistent with the Decommissioning Plan (Future Activities). The terms of the DoN easement for the ~~o~~Onshore ~~s~~Site require the restoration of the easement area to the DoN's satisfaction, but does not define specific restoration requirements. Considering that the DoN has not yet made any decisions regarding restoration of the SONGS site and is not expected to do so for many years, this alternative is highly speculative. The CSLC has no authority related to those decisions. Additionally, this alternative does not reduce any significant adverse impacts of the Proposed Project. Therefore, this alternative is eliminated from further analysis.

5.3.8 Future Uses for the San Onofre Nuclear Generating Station Site

5.3.8.1 Description

This alternative involves consideration of new uses for the onshore SONGS site after the completion of decommissioning, including the possible establishment of public recreational uses at the site similar to the adjacent San Onofre State Beach or the conversion of the decommissioned facility to a solar-powered desalination plant. The SONGS Units 2 and 3 seawater inlet and discharge conduits would need to be preserved for possible future use with a regional scale solar-powered desalination plant. All other aspects of this alternative would be identical to the Proposed Project.

5.3.8.2 Rationale for Elimination

This alternative would not be consistent with Proposed Project objectives because the Proposed Project does not propose any future uses for the SONGS site. Decisions about future uses will be made by the land owner (DoN) rather than the Applicant. Considering that the DoN is not expected to make a final decision regarding future use of the site until after 2035, this alternative is highly speculative. In addition, the CSLC has no authority over the DoN's decision related to an onshore desalination plant, only over the use of sovereign land for any related infrastructure. Finally, this alternative does not reduce any significant adverse impacts of the Proposed Project. Therefore, this alternative is eliminated from further analysis.

5.3.9 Accelerated Removal of Spent Nuclear Fuel from San Onofre Nuclear Generating Station

5.3.9.1 Description

This alternative was formulated in response to public concern about the need to store SNF and other HLW at the SONGS site for a number of years and the desire to make this storage period as short as feasibly possible. As described in the Post Shutdown Decommissioning Activities Report (PSDAR) and the Irradiated Fuel Management Plan (IFMP), the broad sequence of spent fuel management events required to support and complete SONGS Decommissioning Plan includes three major categories of activities: (1) transfer of SNF currently in the spent fuel pools to the on-site Approved ISFSI, (2) extend storage in the Approved ISFSI (for a minimum of approximately 10 years), and (3) transport SNF and other HLW off-site to a repository or interim storage facility. The transfer of SONGS Unit 2 and Unit 3 SNF from the spent fuel pools is ongoing and will be completed by 2019.

The plan and schedule for the off-site shipment of SNF and HLW is currently defined by two related constraints. The first is the availability of an off-site location for disposal. Current law (i.e., the Nuclear Waste Policy Act of 1982) requires that utilities store SNF and HLW on-site until it can be shipped to the Yucca Mountain Repository for disposal. The second schedule constraint is the agreement between the DOE and SCE known as the Standard Contract, which defines the rate at which DOE can receive shipments from each of more than 100 operating and closed commercial nuclear power plants. Based on an assumption that DOE will be ready to begin accepting fuel in 2028 (at Yucca Mountain), the IFMP projects that SONGS SNF and HLW could begin shipment by 2028 (for Unit 1 SNF that has been stored in the existing Approved ISFSI for approximately 15 years). Transportation of SNF from Units 2 and 3 could begin in 2031 and continue until 2049.

If a long-term or interim storage facility is available, it is conceivable that some of the Unit 1 SNF could be packaged and shipped sooner, but most of the Unit 2 and 3 SNF will require cooling for a number of years in the Approved ISFSI before it will meet the thermal requirements for transportation.

This accelerated removal scenario is based on at least four major actions or assumptions that would have to be accomplished in order for the alternative to be viable:

- If a federally operated interim storage facility was to be constructed (as proposed in 2013 by DOE), Congress would have to pass legislation modifying the Nuclear Waste Policy Act and authorizing interim storage prior to the construction and operation of a repository for disposal. Alternatively, if a privately operated interim storage facility was to be used, Congress or the Administration (Executive Branch)

would need to modify current policy and contracts to provide a mechanism for payment or reimbursement of the costs associated with interim storage.

- At least one interim storage facility would need to be licensed to receive and store SNF and HLW. Two private interim storage facilities are in the planning stages: (1) Waste Control Specialists, LLC (WCS) in Texas, which has requested that the NRC temporarily suspend all safety, environmental review, and public participation activities associated with the Consolidated Interim Storage Facility (CISF) Application on April 18, 2017 (NRC 2017b); and (2) Eddy Lea Alliance, LLC (ELEA), which submitted a license application to the NRC on March 31, 2017.
- The dry storage canisters containing SNF in the SONGS Approved ISFSI would need to have cooled sufficiently to meet NRC requirements for transportation, and sufficient transportation casks would have to be procured to meet an accelerated off-site shipment schedule.
- The transportation/shipment schedule would have to be negotiated successfully by SONGS, waste transportation providers, federal and state agencies and regulators (including DOE, NRC, and the U.S. Department of Transportation [USDOT]), and the interim storage facility.

If these requirements are met, removal of SNF and HLW from SONGS could be accelerated. Except for additional planning and preparation to support accelerated transportation, this alternative scenario would be essentially identical to the Proposed Project (through 2031). For the purpose of this alternative, transportation of SNF and HLW is assumed be achieved in approximately 8 years.

The purpose of this alternative is conceptually similar to that of the Settlement Agreement dated August 25, 2017, resolving (*Citizens Oversight, Inc., et al. vs. California Coastal Commission, Southern California Edison Company, et al.* [*Citizens Oversight*] (Superior Court for County of San Diego Case No. 37-2015-00037137-CU-WM-CTL). That Settlement Agreement is described in Section 1.2.2.3, *Settlement Agreement*, and Section 1.5.2, *Uncertainty Regarding Future Decommissioning Plan Activities*.

5.3.9.2 Rationale for Elimination

This alternative does not relate to the Proposed Project objectives, which do not address SNF storage, management, or disposal. The objectives of the Proposed Project are limited to reducing radioactivity at the SONGS site in accordance with NRC regulations, dispositioning the offshore facilities, and completing decontamination of the site (see Section 1.3, *Proposed Project Objectives*).

This alternative is speculative because it is completely dependent on possible future decisions and actions by the federal government. For such an alternative to be possible, Congressional legislation would be required to approve an interim or long-term storage

facility, as well as working through other issues, such as acceptance of liability and payment for services that would otherwise be the responsibility of the federal government (for interim storage). An off-site storage facility (interim or long-term) would also need to complete the licensing process once approved as a viable site. How or when Congress will address the issue of a storage facility for SNF and HLW and thereby provide an option for SONGS SNF and HLW to be transported for off-site storage is not known.

In addition, SNF must be cooled to meet the transportation cask license requirements before it can be transferred off-site; a process which cannot be accelerated. Acceptance of SNF at an approved facility is also limited by federal regulations and Standard Contracts between the DOE and each nuclear utility with "oldest fuel first" allocation. These issues also affect the potential to accelerate removal of SNF.

Furthermore, this alternative would not reduce any significant impacts associated with implementation of the Proposed Project. While this alternative would more quickly eliminate potential hazards associated with storage of SNF on the SONGS site, the storage of SNF in the SONGS Approved ISFSI is part of baseline conditions. Therefore, this alternative would reduce potential hazards associated with existing conditions rather than reducing impacts of the Proposed Project. It is not appropriate under CEQA to consider an alternative that focuses on reducing impacts associated with baseline conditions rather than Proposed Project impacts.

For the reasons described above, this alternative is eliminated from further analysis.

5.3.10 Alternate Sites for Disposal of Spent Nuclear Fuel and Other High-Level Waste

5.3.10.1 Description

Multiple suggestions were received during scoping for locations for off-site storage of SNF in hopes of facilitating its removal from the SONGS site. Therefore, this alternative considers off-site storage of SNF and other HLW at locations suggested during scoping. These include:

- A proposal by WCS for a CISF in Andrews County, Texas. An application for the facility was submitted to the NRC and an Environmental Impact Statement is being prepared. on April 18, 2017, however, WCS requested that the NRC temporarily suspend all safety and environmental review and public participation activities associated with the CISF application (NRC 2017b).
- A proposal by ELEA for the HI-STORE CISF in southeastern New Mexico. ELEA is a partnership of Holtec International and the cities of Carlsbad and Hobbs and the counties of Eddy and Lea. The State of New Mexico has approved the land sale option allowing Holtec International to purchase 1,000 acres of land from

ELEA. The site-specific license application for the HI-STORE CISF was submitted to the NRC on March 31, 2017 (Holtec International 2016).

- Expansion of the Approved ISFSI at the Palo Verde Nuclear Generating Station in Arizona (SCE is a 15.8 percent owner of the Palo Verde Nuclear Generating Station). This is not an active proposal, but rather a suggestion made by members of the public.
- The Yucca Mountain site in Nevada, which Congress directed the DOE to develop as a repository (if it was found to be suitable) through an amendment to the Nuclear Waste Policy Act in 1987. Following the process prescribed in the amended Act, in February 2002, the Secretary of Energy and the President recommended to Congress that Yucca Mountain be developed as the nation's first geologic repository. Yucca Mountain was confirmed by Congress through House and Senate resolutions, but the site recommendation never reached the final step in the regulatory approval process.

5.3.10.2 Rationale for Elimination

This alternative is not consistent with the Proposed Project objectives as it is not an objective of the Proposed Project to determine how the federal government will address the long-term disposition of SNF and other HLW. It is also highly speculative considering implementation is completely dependent on future decisions by the federal government and a long-term storage facility or off-site interim storage facility has yet to be approved or licensed. The CSLC is also not in a position to determine the feasibility of high-level radioactive disposal sites, especially out-of-state sites. Additionally, this alternative does not avoid or reduce any significant impacts of the Proposed Project. Interim storage of SNF at the SONGS site is part of baseline conditions, and it is not appropriate under CEQA to consider an alternative that focuses on baseline conditions rather than Proposed Project impacts. Therefore, alternate sites for disposal of SNF and other HLW have been eliminated from further analysis.

5.3.11 In-State Disposal of Non-Radioactive Waste and Recycling

5.3.11.1 Description

This alternative was considered to reduce adverse air quality, greenhouse gas (GHG), and transportation and traffic impacts by reducing waste transport distances.

Under the Proposed Project, SCE would ship all waste generated by the Proposed Project outside of California for disposal, including sending non-radioactive waste to a nearby out-of-state facility, potentially in La Paz County, Arizona. This is consistent with SCE's interpretation of Executive Order D-62-02, which states that the Water Boards shall take all necessary steps to impose a moratorium on the disposal of decommissioned materials into California's Class III landfills and unclassified waste management units, as described

in California Code of Regulations, title 27, sections 20260 and 20230, and that this moratorium shall remain in effect until the Department of Health Services completes an assessment of the public health and environmental safety risks associated with the disposal of decommissioned materials and its regulations setting dose standards for decommissioning take effect. However, Executive Order D-62-02 focuses on landfill disposal of decommissioning materials and does not address recycling/reuse. Therefore, under this alternative, non-radioactive wastes meeting NRC limits, such as concrete, asphalt, and steel, would be recycled as appropriate using local construction recycling yards, to the extent space is available. All other aspects of this alternative would be identical to the Proposed Project.

5.3.11.2 Rationale for Elimination

While current local regulations (see Section 4.8.2, *Greenhouse Gas Emissions – Regulatory Setting*) require recycling of construction materials, these conflict with Executive Order D-62-02 with respect to the SONGS decommissioning. Furthermore, Executive Order D-62-02 does not specify the acceptable level of radioactivity for placement of materials into California landfills, whereas this alternative assumes meeting NRC limits would be sufficient. As such, this alternative is considered infeasible until the appropriate State agency (Regional Water Quality Control Board or CalRecycle) specifies an acceptable level of radioactivity for decommissioning materials to be placed in California landfills. Therefore, the in-state disposal of non-radioactive waste and recycling is eliminated from further analysis.

5.4 ALTERNATIVES EVALUATED IN THIS EIR

Four alternatives, including the No Project Alternative, are identified for full evaluation and comparison to the Proposed Project (see Table 5-2). Two of the alternatives involve the extent of the removal of the offshore conduits and include full removal (Section 5.4.2) to partial removal (see Section 5.4.3). The No Project Alternative is equivalent to abandonment of the conduits in place, and onshore decommissioning activities would continue under this alternative per the operating license for Units 2 and 3 granted by the NRC (see Section 5.4.1). The other alternative addresses full or partial removal of onshore subsurface structures (Section 5.4.4).

The Full Removal of Offshore Conduits Alternative (Section 5.4.2) is examined in greater detail than the other alternatives because the option to completely remove the conduits represents the fullest exercise of the CSLC's discretion regarding the end-state disposition of the conduits.

5.4.1 No Project Alternative

5.4.1.1 Description

Pursuant to State CEQA Guidelines section 15126.6, subdivision (e), the purpose of describing and analyzing a "no project" alternative is to provide decision makers with comparative information regarding the impacts of approving a project versus not approving a project. The "no project" alternative considers existing environmental conditions as well as what would reasonably be expected to occur in the foreseeable future if the lease associated with the Proposed Project is not approved, based on current plans and other available information about expected future conditions.

Under the No Project Alternative, the new CSLC lease requested by the Applicant would not be approved and the existing lease for the Unit 2 and Unit 3 offshore conduits, environmental monitoring buoys, and riprap along the shore seaward of the ordinary high-water mark would expire in 2023. The offshore intake and discharge conduits and fish return conduit associated with Units 2 and 3 would not be dismantled and would remain in their current position and configuration. No components of the conduits would be removed or altered. Ongoing discharges through the offshore conduits would continue, including sewage treatment plant effluent, stormwater, and wastewater, as well as ~~to~~ new discharges of ~~processed~~ treated water from the spent fuel pools related to onshore decommissioning, in accordance with the SONGS National Pollutant Discharge Elimination System (NPDES) permit. Similarly, the SONGS environmental monitoring and navigational buoys ~~and riprap along the shore seaward of the ordinary high-water mark~~ would remain in place. The Applicant would retain responsibility for the structures under an agreement with the CSLC.

Onshore decommissioning activities would continue under the No Project Alternative. The onshore decommissioning activities are allowed under the operating license for Units 2 and Unit 3 granted by the NRC and would continue under the No Project Alternative.

5.4.1.2 Environmental Impact Analysis

The impacts of the No Project Alternative compared to the Proposed Project are presented in Table 5-2 below.

Table 5-2. Summary: No Project Alternative

HAZARDOUS AND RADIOLOGICAL MATERIALS
• Radiological impacts would not substantially differ from the Proposed Project because the residual radiological contamination level associated with the offshore conduits is minimal and is expected to be well below NRC unrestricted release criteria. Onshore decommissioning activities may temporarily rely on the Unit 2 offshore conduit for discharge, but the continued presence or absence or either conduit would not radiologically impact activities. Although Impacts HAZ-1 through HAZ-3 would comply with NRC standards, plans, and procedures, due to federal preemption (see Section 1.2.1.3, *Federal Preemption*),

Table 5-2. Summary: No Project Alternative

CSLC lacks authority over these plans and procedures, and these impacts would remain significant and unavoidable. • Differences between this alternative and the Proposed Project occur on the seafloor where no additional non-radiological hazardous materials occur. The volume of non-radiological hazardous waste generated during decommissioning under this alternative (i.e., hazardous building materials, contaminated soil) would be identical to the Proposed Project (Impact HAZ-4) and would be addressed by Applicant-proposed measure (APM)-1, APM-2, and Mitigation Measure (MM) HAZ-4. The risk to the public through the use or disposal of non-radiological hazardous materials (Impact HAZ-4) would not be significant with implementation of APM-1 and APM-2 and MM HAZ-4. • Because no offshore work would occur under this alternative, the likelihood of hazardous fluid leaks into marine waters would be reduced (see Impact WQ-3). Like the Proposed Project, the onshore risk of flammable or toxic hazardous waste spills (Impact HAZ-5) would be less than significant with adherence to APM-1, APM-12, APM-13, and APM-14. • Given that the proposed removal of below-ground structures would not change under this alternative, the risk of exposing workers to hazardous materials onshore in contaminated soil or groundwater (Impact HAZ-6) would be the same as under the Proposed Project. With implementation of APM-12 and MM HAZ-6, this impact would be less than significant. • As with the Proposed Project, with implementation of the same APMs and mitigation measures, this alternative would not significantly contribute to adverse cumulative impacts.
AESTHETICS
• Impacts would not differ substantially from the Proposed Project as improvements to visual conditions associated with removal of the above-ground SSCs would also occur under this alternative. The Unit 2 and Unit 3 offshore intake and discharge conduits, riprap, and monitoring buoys that would remain in place under this alternative would not constitute a significant change in the visual conditions of the site, as it is a baseline condition. Similar to the Proposed Project, Impacts AES-1 and AES-3 would remain beneficial, and Impacts AES-2 and AES-4 would be less than significant. • As with the Proposed Project, this alternative would not significantly contribute to adverse cumulative impacts, due to the benefits of removal of the onshore SONGS facilities.
AIR QUALITY
• The criteria air pollutant emissions from this alternative would be lower than those from the Proposed Project, as offshore work would not be conducted. Based on interpreting the daily peak emissions data provided in Appendix E1, the unmitigated emissions would no longer exceed the hourly NO_X screening-level threshold in San Diego County. However, daily peak NO_X emissions within South Coast Air Quality Management District (SCAQMD) and Mojave Desert Air Quality Management District (MDAQMD) jurisdictions would still exceed the applicable screening-level threshold. Therefore, like the Proposed Project, the unmitigated emissions would be significant. APM-3 and MM AQ-3a would still be required to reduce the NO_X emissions impacts (Impact AQ-3) to the extent feasible. MM AQ-3b, which mitigates marine vessel emissions, is not relevant to this alternative. NO_X emissions impacts within the SCAQMD's jurisdiction would remain significant and unavoidable. • This alternative, like the Proposed Project, would have less-than-significant impacts related to air quality/local plan conformance (Impact AQ-1), exceedances of air quality standards (Impact AQ-2), impacts to sensitive receptors (Impact AQ-4), and odors (Impact AQ-5). • As with the Proposed Project, this alternative would result in a significant and unavoidable cumulative NO_X emissions impact; all other cumulative impacts for air quality would be less than significant.

Table 5-2. Summary: No Project Alternative

BIOLOGICAL RESOURCES
• Impacts to terrestrial biological resources would not differ from the Proposed Project because onshore decommissioning activities would continue in the same manner as the Proposed Project. • There would be no negative anticipated impacts to the marine environment from this alternative as no offshore work would be conducted to remove the SONGS Units 2 and 3 conduits. No impacts would occur under Impacts BIO-8 through BIO-12. • As with the Proposed Project, this alternative would not significantly contribute to adverse cumulative impacts.
CULTURAL AND PALEONTOLOGICAL RESOURCES
• Onshore impacts to cultural resources would be the same as the Proposed Project. Implementation of APM-10, APM-11, and MMs CR/TCR-2a and CR/TCR-2b would reduce potential impacts to a less-than-significant level. • Similar to the Proposed Project, no impacts to potential cultural resources in offshore areas would occur since offshore facilities would not be decommissioned. MM CR/TCR-2c, which requires offshore geophysical surveys, is not relevant to this alternative. • Onshore impacts to paleontological resources would also be the same as the Proposed Project. Implementation of MMs CR-4a and CR-4b would reduce potential impacts to a less-than-significant level. • The potential for offshore impacts to paleontological resources would be avoided since offshore conduits and associated equipment would remain in place, thus avoiding potential disturbance of sensitive paleontological geological units located beneath the ocean floor. • As with the Proposed Project, with implementation of APMs and MMs, this alternative would not significantly contribute to potential adverse cumulative impacts to cultural and paleontological resources.
CULTURAL RESOURCES – TRIBAL
• Onshore impacts to Tribal cultural resources would remain the same as the Proposed Project under this alternative. Implementation of APM-10, APM-11, and MMs CR/TCR-2a and CR/TCR-2b would reduce potential impacts to a less-than-significant level. • No impacts to Tribal cultural resources in offshore areas would occur under this alternative since offshore facilities would not be removed. MM CR/TCR-2c, which requires offshore geophysical surveys, is not relevant to this alternative. • As with the Proposed Project, with implementation of MM CR-4a and CR-4b, this alternative would not significantly contribute to adverse cumulative impacts.
GEOLOGY, SOILS, AND COASTAL PROCESSES
• Activities for this alternative would not include decommissioning of conduit components offshore and, therefore, no impacts would occur related to nearshore and offshore slope stability. Impacts related to onshore activities would be the same as described for the Proposed Project. • Coastal process impacts would not occur under this alternative as conduit structure modifications would not occur, and water discharges through the offshore conduits would continue as under existing conditions. • As with the Proposed Project, this alternative would not significantly contribute to adverse cumulative impacts.
GREENHOUSE GAS EMISSIONS
• The GHG emissions from this alternative would be somewhat reduced in comparison to the Proposed Project due to the elimination of offshore work. Therefore, like the Proposed Project, the unmitigated emissions would be less than significant (Impact GHG-1).

Table 5-2. Summary: No Project Alternative

• This alternative, like the Proposed Project, would have less-than-significant impacts related to compliance with GHG emissions reduction plans, policies, or regulations (Impact GHG-2).
HYDROLOGY AND WATER QUALITY
• Because onshore Decontamination and Dismantlement (D&D) activities under this alternative would be the same as the Proposed Project, impacts related to polluted runoff (Impact WQ-1) and depletion of groundwater (Impact WQ-3) would be identical to the Proposed Project, resulting in less-than-significant impacts. • The potential for encountering contaminated groundwater during onshore decommissioning activities (Impact WQ-2) would be the same as the Proposed Project and impacts can be reduced to a less-than-significant level with implementation of MM HAZ-17. • Because onshore decommissioning activities would be identical to the Proposed Project, the potential for erosion or siltation (Impact WQ-4) would be the same as the Proposed Project, resulting in less-than-significant impacts with implementation of APM-12 and MM WQ-4. • Onshore alterations to drainage patterns (Impact WQ-5) would be the same as the Proposed Project with the potential for drainage alterations to adversely affect the shoreline public access walkway. This impact can be mitigated to a less-than-significant level with implementation of MM WQ-5. • Impacts WQ-6 and WQ-7 apply to marine water quality. Since no offshore demolition activities would occur, no increase in ocean turbidity and marine debris would result. Onshore activities could potentially result in chemical spills that could affect marine water quality, same as the Proposed Project; this impact is less than significant with implementation of APM-1, 15, 16, and 17. • As with the Proposed Project, with implementation of APMs and MMs, this alternative would not significantly contribute to adverse cumulative impacts.
LAND USE AND PLANNING
• Like the Proposed Project, implementation of the No Project Alternative would not conflict with applicable land use plans, policies, and regulations of agencies with jurisdiction. No impacts related to Impact LU-1 would occur. • Fewer activities would occur offshore and along the shore, which reduces temporary disturbances to onshore and offshore uses, including sensitive uses (Impact LU-2). • With implementation of MMs LU-2a, LU-2b, and LU-2c, cumulative impacts would be less than significant.
NOISE
• Activities occurring under the No Project Alternative would not result in substantial permanent noise sources. Temporary construction land-based noise and vibration levels for onshore decommissioning activities would be identical to those discussed in Impacts NOI-1 through NOI-3 for the Proposed Project. • Offshore activities associated with conduit component removal would not occur, thereby avoiding temporary noise associated with those decommissioning activities. • Since there would be no offshore demolition activities, no underwater noise would be generated, thereby avoiding potential impacts to divers and no impact would occur.
RECREATION AND PUBLIC ACCESS
• ~~Offshore conduit dispositioning~~ CSLC Lease Offshore Activities would not occur thereby avoiding intermittent restrictions or prohibitions on public access to shoreline and water-dependent recreational facilities. • The elimination of offshore activities would reduce the number of personnel required for decommissioning activities, which would reduce the potential for personnel to use nearby parks and campgrounds. Most decommissioning personnel would commute from San Diego

Table 5-2. Summary: No Project Alternative

and Orange Counties, which would reduce this potential further. Additionally, both San Onofre and San Clemente State Beaches have limitations on the number of days that campgrounds can be used by an individual, as well as how frequently a campground can be re-accessed. Therefore, Impact REC-2 would be less than significant. • Onshore activities would be identical to the Proposed Project, including construction staging and demolition near existing recreation areas. Implementation of APM-18 and MM REC-1a would ensure that recreationists are kept clear of hazardous areas, thereby reducing Impact REC-3 to less than significant. • With implementation of APM-18 and MMs REC-1a and REC-1b, contributions to cumulative impacts would be less than significant.
TRANSPORTATION AND TRAFFIC
• Under the No Project Alternative, onshore decommissioning activities would continue. Therefore, onshore transportation and traffic impacts would be the same as the Proposed Project. D&D activities would temporarily increase truck trips, but these additional trips would have a less-than-significant impact on affected intersections (Impact TR-1). REC-1b and APM-19 and APM-20 would further reduce impacts. • Because onshore activities would not differ from the Proposed Project, impacts on pedestrian and bicycle safety (Impact TR-2) would be the same as the Proposed Project. APM-21 would require coordination with the Department of Parks and Recreation to ensure that appropriate steps are taken to ensure continued pedestrian and bicyclist access and safety, and with implementation of MMs REC-1a, Impact TR-2 would be less than significant. • Effects on rail operations would be the same as the Proposed Project and less than significant (Impact TR-3). Safety impacts related to site access (Impact TR-4) would also be less than significant. • Because removal of components of the offshore conduits would not occur, no impacts related to marine vessel safety would occur (Impact TR-5). • As with the Proposed Project, this alternative would not significantly contribute to adverse cumulative impacts.
UTILITIES AND PUBLIC SERVICE SYSTEMS
• Like the Proposed Project, implementation of this alternative would not result in the need for new or physically altered public service or government facilities to maintain the current level of fire protection or emergency response services. Abandonment of the conduits in place would not constitute a significant change in the use of or need for utilities or public service systems. Impacts USS-1 through USS-4 would remain less than significant and no conflicts with applicable solid waste statutes and regulations would occur (Impact USS-5). • As with the Proposed Project, this alternative would not significantly contribute to adverse cumulative impacts.

5.4.2 Full Removal of Offshore Conduits

5.4.2.1 Description

This alternative was ~~proposed~~ identified by SCE in its application to the CSLC (Conduit Alternative #5) and further refined in SCE's *SONGS Decommissioning Project (Units 2 and 3 Offshore Conduits) Engineering Study of Conduit Disposition Alternatives* (COWI 2017 – Option 3). In addition to the conduit components removed under the Proposed Project (MAPS, POIS, AOIS, and 12 diffuser ports), this alternative would include full

removal of the SONGS Unit 2 and Unit 3 offshore intake and discharge conduits, all 126 diffuser ports, the fish return conduit (located in the same trench as the Unit 2 intake conduit), and the culverts to which they connect seaward of the seawall. This alternative would not meet ~~the~~ all Proposed Project objectives~~, and~~ but may fulfill the new CSLC lease requirements, which would (as was the case with existing Lease No. PRC 6785.1) provide the CSLC with discretion regarding the end-state requirements for improvements, including full removal. There are no identified technical, regulatory, or legal feasibility issues with this alternative. Complete removal of the offshore conduits would take approximately 30 months, as opposed to the Proposed Project, which would take approximately 7 months (COWI 2017). Approximately 133,400 tons of concrete would need to be disposed of compared to approximately 2,400 tons under the Proposed Project, and approximately 400,000 cubic yards of sand would be dredged compared to approximately 1,156 cubic yards under the Proposed Project (COWI 2017). In addition, this alternative would increase the disturbance area associated with conduit removal activities from just over 1 acre under the Proposed Project to approximately 20 acres (COWI 2017).

Full removal of the horizontal conduits under this alternative would require construction of two temporary trestles, providing approximately 3,400 linear feet of access for removal of each unit. The trestles may be installed in series to reduce the amount of steel required. The trestle location surf zone limit was established at a depth of 29 feet, which is located at an approximate distance of 2,925 feet from the zero contour (MLLW = 0 feet). The extent of shallow waters out to this distance result in a large surf zone and drives the need for the trestle to provide access in areas otherwise inaccessible by workboats or barge. Outside of the surf zone, it is anticipated the conduits would be extracted using a spud-anchored and four-point anchor arrangement system barge, which would provide stability from swells and turbulent conditions resulting from storms. The final anchor arrangement would be subject to change based on conditions and approval of the contractor's barge mooring arrangement.

Assuming use of a clamshell to remove accumulated sediment on top of the conduits, dredged material would be side cast within the approved CSLC lease area boundaries. If side casting is not possible due to regulatory agency requirements, a Dredging Plan (APM-15) would be developed. If necessary, rocks would be relocated and would be side cast within the CSLC lease area boundaries. However, unlike the Proposed Project, a large volume of material would need to be imported to backfill open trenches. Potential options for backfilling the open trenches include: (1) using offshore borrow areas near Oceanside to the extent they are available, (2) creating an offshore pit, or (3) borrowing from a wider footprint adjacent to the conduit in order to fill the trench so that a more shallow and acceptable depression footprint is left.

Conduit removal activities would occur in the following four work areas to minimize interferences with land-based operations/infrastructure and decommissioning of the onshore power plant.

- **Deep-water Zone** – accessed by floating equipment
- **Surf Zone** – accessed by trestle erected from deep water shoreward
- **Beach Zone** – accessed by temporary land approaches
- **Land-based Zone** – associated with the stop gate work

The description of conduit removal work in each zone is detailed below.

Deep-water Zone. The conduit sections would be removed using floating equipment (e.g., barges, tugs, cranes) towed to the site from the POLB. Workmen and service equipment would mobilize from Dana Point Harbor using crew boats. Conduit section removal with floating equipment would commence offshore and would gradually work its way east toward the AOISs. ~~No other vertical structures are within the 300 feet of conduit being removed.~~ While the deep-water demolition is in process, the trestle installation would also be underway (see Surf Zone description below).

Surf Zone. Trestle installation would begin by the AOIS and then move progressively towards shore, so that the barge would have sufficient clearance under the hull to clear the seabed. Piles would be initially driven from the barge and a platform created so that a mounted crane could be hoisted and assembled on the trestle. The conduit removal in the surf zone would then be carried out using a crane and cradle horse assembly, and move progressively towards shore with piles being driven to the required tip elevation followed by installation of beams, wales, crane rails, and matting to essentially move the trestle shoreward.

To remove conduit pipe sections, a clamshell bucket or other current technology would be used by the crane to excavate around the conduits and side-cast the excavated sediment. After excavation of accumulated sediment and rigging operations around the conduit (pipe) are completed, all concrete pipe sections (including attached vertical structures such as diffuser ports) would be hoisted to the water surface with diver support and floated to deep water. Support for this operation would be provided by the trestle crane and workboat. At deep water, the pipe would be hoisted with the assistance of two floating derrick barges onto a material barge anchored at the intake structure and towed to POLB (once fully loaded). Up to 60 barge loads of pipe would be towed to POLB for processing. After processing, the concrete would be loaded to trucks and hauled to La Paz County Landfill in Arizona or another similar out-of-state landfill for disposal.

The void left on the seabed after removal of the conduit would vary along the length of removal. The smallest void section would be at the single 10-foot diffuser discharge point, and the largest void would be at the 18-foot intake pipe location which shares a trench with the 18-foot diameter pipe. At the diffuser end where the single 10-foot diameter

conduit is removed, the void expected would be a trapezoid shape with a top width of 50 feet, bottom width of 10 feet, and a depth of 25 feet. For the dual intake and discharge 18-foot-diameter pipe trench, at the deepest location, the trapezoid top width would be 130 feet, bottom width of 60 feet, and trench height of 30 feet.

Beach Zone. Once the conduits are completely removed, the temporary trestle would be used to install a double-walled cut-off sheet pile braced wall across the face of the inshore reinforced concrete culverts. Installation of the remainder of the cut-off wall would continue from the existing sidewalk toward the revetment toe of the seawall. Sand from excavations to expose the concrete conduit would be placed within the double cut-off wall and access would be built systematically for equipment needed to carry out the concrete culvert demolition.

Rock groins would be installed starting at the existing seawall and moving towards the trestle. While rock groins are being built, the top of the existing culverts would be exposed using excavators. The exposure of the culverts would start at the shoreline and continue toward the trestle. The existing cut-off wall would then be dewatered with a minimum of three pumps. The discharge from within the cut-off walls would be stored in tanks and treated as necessary prior to disposal. Soil adjacent to the culverts would be excavated in order to facilitate the removal of the culverts. Culverts would then be demolished, removed from within the cut-off wall, and disposed of by truck. Once the culverts are removed, the rock groins would be used as backfill to fill the void left in the seafloor.

Once the culvert boxes are removed, shoring the seawall, likely using micro-piles to support the wall foundation, would commence. Specialized low headroom equipment would be required for drilling the piles, two at the north and two at the south end of the culverts. A shoring and bracing plan for the beams underneath the seawall would be implemented and monitored for movement during the work. Once shoring piles are installed, the concrete culvert boxes would be removed. The contractor may need to install support jacks along with the underpinning, to stabilize the seawall safely.

Once the concrete culvert is removed, rock fill would be used in a controlled operation to fill voids under the seawall and culvert excavation voids. The groin rock may be placed to stabilize the wall and build a slope revetment for the replacement walkway.

Land-based Zone. The onshore ~~phase of the conduit dispositioning~~ work during CSLC Lease Offshore Activities would involve the installation of stop gates with a watertight seal to prevent ocean water from entering the power plant during the removal of the offshore conduits (same as the Proposed Project).

Similar to the Beach Zone, removal of the inshore reinforced concrete culvert in the Land-based Zone would include construction of a double-walled cut-off sheet pile braced wall. Unlike in the Beach Zone where the trestle would provide construction access, two fronts are proposed from the existing sidewalk – one from the west side working seaward and

the other working from the east side seaward. The third front would be from the trestle working east to west or west to east and connecting with the two land originated fronts (see Beach Zone discussion above). Following dewatering and breaking the concrete, concrete debris would be hoisted by crane bucket from the current walkway to a staging area behind the upper seawall. The debris would be processed and loaded on to dump trucks for off-site removal.

Similar to the Beach Zone, rock groins would be used as backfill for the areas where the culverts have been removed. The earthwork equipment would likely retreat towards shore while placing previously used rock in the excavations. The sheet pile cut-off wall around the culvert/conduit location would be removed by the trestle crane.

The trestle would be de-constructed in reverse manner to its original sequence of installation. In deep water, floating marine equipment would assist in unloading the piles, beams and decking from the trestle. Finally, the trestle crane and remaining trestle structure would be removed systematically and in sequence.

For removal of the culverts to the stop gates, the excavation would be carried out at the current walkway location inside the shoreline. Approximately 250 feet of existing revetment concrete wall and existing asphalt walkway would be removed prior to the start of excavation. This section of wall and walkway would be restored once culvert removal activities are completed.

As described for the Beach Zone, permanent micro piles and shoring under the seawall would be installed prior to and during the culvert removal. Equipment would be lowered by crane to the workface from above the seawall.

After the concrete culvert is removed, rock would be used as backfill under the seawall and the reinstated walkway and revetment wall. Surplus rock from the temporary rock breakwater would strategically be installed on the adjacent shoreline runs as new slope protection.

Upon completion of the removal of the Unit 2 conduits, the entire deep water, trestle, beach, and onshore access demolition process along with the corresponding equipment would be repeated for Unit 3. The sequence would occur in the same manner as described above for Unit 2. Upon completion of Unit 3 work, the marine equipment spread would be demobilized and towed to its homeport.

5.4.2.2 Environmental Impact Analysis

As noted above, the CSLC has discretion regarding the end-state requirements for improvements on State-owned lands, including requiring full removal of all structures. In addition, during scoping, comments were received requesting a complete analysis of the full removal alternative. Therefore, it was determined that this alternative should be

analyzed at the same level of detail as the Proposed Project. The impacts of the Full Removal of Offshore Conduits Alternative compared to the Proposed Project are described below.

No Change in Impacts

For some environmental issue areas, implementation of the Full Removal of Offshore Conduits Alternative would not result in any changes compared to those of the Proposed Project. This is primarily because impacts under this alternative would only change in the offshore area (for conduit decommissioning). Onshore impacts would be the same as described for the Proposed Project. For the issue areas described below, impacts associated with this alternative would be generally the same as described for the Proposed Project:

- **Aesthetics.** Onshore changes and related aesthetic impacts under this alternative would be the same as the Proposed Project (Impacts AES-1, AES-3, and AES-4). As with the Proposed Project, permanent removal of prominent onshore structures would notably improve the coastal viewshed from existing conditions under this alternative. Offshore activities would differ from the Proposed Project, and the aesthetic impact from these offshore activities (Impact AES-2) is discussed below.
- **Biological Resources – Terrestrial.** Under the Full Removal of Offshore Conduits Alternative, impacts to terrestrial biological resources would not differ from the Proposed Project as onshore decommissioning activities would continue in the same manner as the Proposed Project. As with the Proposed Project, this alternative would not significantly contribute to adverse cumulative impacts related to terrestrial biological resources.
- **Cultural and Paleontological Resources.** Onshore activities for this alternative remain the same as for the Proposed Project. There are no known cultural resources in the onshore or offshore areas; however, offshore activities for this alternative include movement of ocean floor sediment that is in high sensitivity paleontological geological units (see Figure 4.5-1). Although activities for this alternative would increase ocean floor disturbance, it would be limited to areas previously disturbed during the initial installation of the conduits. However, like the Proposed Project, there could be the potential to directly or indirectly affect any presently unidentified historical or unique archaeological resources in the onshore or offshore Proposed Project areas. Thus, onshore and offshore impacts to cultural resources under this alternative would be the same as for the Proposed Project, however, the potential for an impact increases slightly due to the greater offshore disturbance area. The same Applicant-proposed measures and mitigation measures applicable to the Proposed Project would apply to this alternative. This alternative would not result in cumulative impacts to cultural resources, similar to the Proposed Project.

- **Cultural Resources – Tribal.** Onshore activities for this alternative would be the same as the Proposed Project. There are no known tribal cultural resources in the onshore or offshore areas. Offshore activities for this alternative would cause ocean floor disturbance that may disturb previously unrecorded tribal cultural resources. Thus, onshore and offshore impacts to cultural resources under this alternative would be the same as the Proposed Project, although the potential for an impact increases slightly due to the greater offshore disturbance area. The same Applicant-proposed measures and mitigation measures applicable to the Proposed Project would apply to this alternative. This alternative would not result in cumulative impacts to Tribal cultural resources, similar to the Proposed Project.
- **Geology and Soils.** Activities for this alternative only differ from the Proposed Project as it relates to conduit decommissioning offshore. As with the Proposed Project, there is no impact related to seismic hazards and no impact related to slope instability due to the flat to gently sloping nature of the seafloor. Impacts related to nearshore and offshore sediment disturbance due to construction are addressed in the *Geology, Soils, and Coastal Processes* section below. Onshore changes under this alternative would be the same as the Proposed Project. As with the Proposed Project, this alternative would not result in any cumulative impacts related to geology and soils.
- **Hydrology and Water Quality – Surface (Terrestrial) Water and Groundwater.** Because onshore activities under the Full Removal of Offshore Conduits Alternative would be identical to the Proposed Project, impacts related to potential contamination of surface water and groundwater from onshore activities would be the same as described for the Proposed Project.
- **Land Use and Planning.** Land use jurisdictions and plans for this alternative are the same as described for the Proposed Project. Activities under this alternative would be consistent with applicable land use plans, policies, and regulations just as they would be for the Proposed Project. As described for the Proposed Project, this alternative would result in less-than-significant disruptions of sensitive land uses during decommissioning activities. Cumulative impacts related to land use and planning would be identical to the Proposed Project.
- **Utilities and Public Service Systems.** The majority of impacts associated with utilities and public service systems would occur onshore. The main difference between this alternative and the Proposed Project occur within the offshore area. As part of the required construction activities for this Alternative, two temporary trestles would be constructed in the offshore area of SONGS to provide access for construction activities. Installation of the trestle would introduce a new navigational hazard (as defined in 33 CFR 64.31), which would be constructed outside the existing Exclusion Area Boundary, but within the Safety Zone as required by ALT MM NOI-4b (Establish Safety Zone). Additionally, this alternative would include implementation of APM-18 (Notification of Local Mariners), APM-22 (Private Aids

to Navigation), and ALT MM NOI-4a (Advanced Notice to Swimmers and Divers). These APMS and ALT MM would serve to reduce the potential need for offshore emergency services which could otherwise result from the introduction of a new navigational hazard in the region.

While this alternative would increase the intensity and duration of offshore demolition activities, it would not result in an increase in the need for offshore law enforcement or services which would necessitate new facilities. The SONGS site, including the offshore area, would continue to be served by emergency response providers, as identified in Section 4.14.1, *Environmental Setting*. Cumulative impacts related to Utilities and Public Service Systems would be identical to the Proposed Project.

The environmental issue areas with differences in impacts compared to the Proposed Project are discussed below.

Hazardous and Radiological Materials

The Full Removal of Offshore Conduits Alternative would involve shoreline, nearshore, and prolonged or intensified offshore activities that would not occur under the Proposed Project. In addition, this alternative would require substantially more beach, nearshore, and offshore dredging and excavation in comparison to the Proposed Project because all of the offshore facilities would be removed instead of just a small portion of them.

Environmental Impact Analysis and Mitigation

This analysis assesses the alternative's potential to expose workers or the public to radiological and non-radiological hazards. The baseline, regulatory setting, and significance criteria for this alternative are identical to those described for the Proposed Project in Section 4.1, *Hazardous and Radiological Materials*. The focus of this analysis is on the differences between the alternative and the Proposed Project.

Differences between this alternative and the Proposed Project occur on the seafloor where no additional non-radiological hazardous materials occur. For offshore activities, however, radiological risks would increase compared to the Proposed Project because material with detectable amounts of radiation could be brought to the surface and the disturbance of ocean sediments could resuspend contaminants. For onshore activities, the radiological risks and impacts associated with this alternative are identical to those associated with the Proposed Project. Overall, radiological exposures would remain Significant and Unavoidable.

Impact HAZ-1: Release of Hazardous Radioactive Materials during Decommissioning and Disposal.

The decommissioning activities associated with the Full Removal of Offshore Conduits Alternative could significantly increase worker risk above baseline operations and create a significant hazard to the public **(Significant and Unavoidable)**.

Impact Discussion. The offshore operations described for this alternative would generally be performed over water and do not constitute an additional risk to onshore soil and groundwater. Significant additional airborne releases of radioactive material are not anticipated under this alternative. The DGC would provide monitoring through the SONGS Radiological Environmental Monitoring Program.

The CB&I survey stated that low levels of one plant related radionuclide, cobalt-60, were detected in two of the sediment samples near the Unit 2 diffuser ports and one of the samples collected near the Unit 3 conduit displacement. Currently, as only a scoping survey was performed, the extent and depth of contamination in ocean bottom sediment is unknown; however, these results indicate that dredged side-cast sediment is impacted "decommissioned materials" and would contain detectable quantities of radioactive material (CB&I 2017). Although the level of radioactivity is very low and is expected to meet the release standards established by the NRC. Radiation exposures would be less than significant per NRC standards, but the waste volume leaving the site for out-of-state processing and the influx of clean backfill material would increase traffic flow.

Although SCE is required by the NRC operating license to implement detailed plans and procedures to ensure that radiological releases due to increases of residual radioactivity concentrations in soil or groundwater are minimized or avoided, these plans and procedures would not be completed until later in the process. In addition, due to federal preemption, CSLC lacks authority over these plans and procedures. Therefore, there are no feasible mitigation measures that would reduce potential significant effects associated with radiological releases.

Similar experience with low-level radioactivity at SONGS Unit 1 resulted in release of its offshore conduit by the NRC (see Section 4.1) (SCE 2007; NRC 2009). The baseline conditions for SONGS Units 2 and 3 offshore appear similar.

Implementation of an offshore Characterization Plan per Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) standards (see Section 4.1.1.5~~4~~, *Radiological Studies*, for information on the MARSSIM and its supplement, the Multi-Agency Radiation Survey and Assessment of Materials and Equipment Manual [MARSAME]) would enable the Applicant to evaluate the extent and depth of radioactive contamination in the ocean bottom sediment prior to dredging and identify whether any additional mitigation is required. The Decommissioning General Contractor (DGC) would need to develop

Derived Concentration Guideline Levels (DCGLs) from the characterization data to develop plans for decontamination, dismantlement, and disposal; to estimate the associated costs; and for input to the design of the Final Status Survey. Early confirmation of the DCGLs could save time through proper identification of radioactive waste versus normal waste.

If the additional sampling results are similar to those from the scoping survey, the potential for polluted runoff would be sufficiently low, and impacts would be less than significant. Monitoring requirements would be determined from characterization results. The risk of beach closures from decommissioning activities associated with the Full Removal of Offshore Conduits Alternative is also negligible if characterization results are similar to the levels described in the report (CB&I 2017). Implementation of the following APMs that would be implemented under the Proposed Project would reduce potential impacts but not to a less-than-significant level: APM-1, APM-4, APM-12, APM-13, and APM-14.

Impact HAZ-2: Additional Emergency Response Capabilities Required During Decommissioning.

The emergency response capability at SONGS must be appropriate for the level of risk associated with decommissioning, so that it does not represent a significant hazard to workers, the public, or emergency responders **(Significant and Unavoidable)**.

Impact Discussion. No significant difference is noted between the Proposed Project and this alternative. Impacts would be the same as described for the Proposed Project under Impact HAZ-2.

Impact HAZ-3: Exposure to Radioactive Groundwater Contamination.

Decommissioning activities may uncover a previously unknown radioactive groundwater plume (or some other groundwater contamination) and present an additional hazard to workers or the public **(Significant and Unavoidable)**.

Impact Discussion. Offshore decommissioning activities for the Proposed Project or this alternative would not affect whether a radioactive groundwater plume or other groundwater contamination exists. Therefore, impacts would be the same as described for the Proposed Project under Impact HAZ-3.

Impact HAZ-4: Handling of Non-Radiological Hazardous Wastes.

The Full Removal of Offshore Conduits Alternative could substantially increase risk above existing baseline conditions and create a substantial hazard to the public through the use or disposal of hazardous materials **(Less than Significant with Mitigation)**.

Impact Discussion. Hazardous waste generated during the Proposed Project would be stored, managed, and transported according to existing requirements of the SONGS hazardous waste permit, NRC, and USDOT requirements. The Full Removal of Offshore Conduits Alternative would not result in increased handling and disposal of non-radiological hazardous waste because the additional work would occur on the seafloor where no additional non-radiological hazardous materials occur. This alternative would have the same or a slightly greater risk of leaks of hazardous fluids into marine waters than the Proposed Project, but impacts would be reduced with the inclusion of APM-1, APM-2, and MM HAZ-4, such that overall effects from the disposal of non-radiological hazardous materials under this alternative would be less than significant. Onshore impacts under this alternative would be the same as the Proposed Project.

Impact HAZ-5: Risk of Fire, Explosion, or Hazardous Material Release.

The Full Removal of Offshore Conduits Alternative could substantially increase risk above existing baseline conditions related to fire, explosion, or release of flammable or toxic materials, and may create a substantial hazard to the public **(Less than Significant with Mitigation)**.

Impact Discussion. The Full Removal of the Offshore Conduits Alternative would not result in an increased hazard from fire, explosion, or release of flammable or toxic materials compared to the Proposed Project. The slightly increased amount of offshore demolition work would not result in a significant increase of these hazards. Removal of hazardous substances prior to demolition in accordance with standard practices and the use of safety equipment would be addressed by APM-1. In addition, APM-12, APM-13, and APM-14 would be implemented along with MM HAZ-5 to ensure that impacts related to fire, explosion, or hazardous material release would be less than significant.

Impact HAZ-6: Mobilization of Existing Contaminants.

The Full Removal of Offshore Conduits Alternative could mobilize existing soil or groundwater contamination and expose workers to hazardous materials **(Less than Significant with Mitigation)**.

Impact Discussion. Similar to the Proposed Project, contaminated soil and groundwater may be encountered during onshore structure removal if any leaks or spills reached the underlying soil. Unanticipated soil contamination could exist in many areas of the SONGS facility and include gasoline and diesel fuel residuals, heavy metals, solvents, oil, PCBs, and other hazardous materials. To reduce potential impacts associated with exposure of workers to unknown contamination, the SWPPP (APM-12) and MM HAZ-6 ~~is~~are recommended. MM HAZ-6 would develop and implement a comprehensive soil and groundwater characterization study prior to the start of soil excavation to provide a better understanding of subsurface conditions prior to excavation of soil and removal of structure

foundations. Thise mitigation measures would also require a soil management plan be implemented to ensure proper identification and disposal of contaminated soil. These measures would effectively mitigate adverse impacts related to unknown onshore contaminated soil and groundwater, and worker exposure to hazardous chemicals. Other activities associated with the Full Removal of Offshore Conduits Alternative would occur offshore where existing soil or groundwater contamination is not likely. Therefore, offshore activities associated with this alternative would not expose workers to hazardous materials.

Cumulative Impacts

Similar to the Proposed Project, none of the planned or proposed projects identified for assessment of cumulative effects involve the use of radiological materials or the risk of inadvertent exposure to radioactivity. As a result, there are no reasonably foreseeable scenarios that could result in the alternative contributing to significant cumulative impacts that would affect the analyses presented above or present a cumulative risk to any receptors. With regard to non-radiological hazards, none of the projects that were identified, when considered together with the effects of the alternative, would make a considerable contribution to cumulative effects.

Aesthetics

Environmental Impact Analysis and Mitigation

As discussed at the beginning of Section 5.4.2.2 under *No Change in Impacts*, activities for the Full Removal of Offshore Conduits Alternative only differ from the Proposed Project as it relates to conduit decommissioning offshore. Therefore, Impacts AES-1 (Affect a Scenic Vista), AES-3 (Degrade Visual Character or Quality of Site and its Surroundings), and AES-4 (Create Light and Glare) are the same as the Proposed Project, as discussed in Section 4.2, *Aesthetics*, and are not further discussed below.

Impact AES-2: Damage Scenic Resources.

The Full Removal of Offshore Conduits Alternative could damage scenic resources, including the viewshed within a scenic highway **(Less than Significant).**

This alternative differs from the Proposed Project in that it would involve additional conduit excavation activities along the seafloor, which would require the construction of two temporary trestles extending approximately 3,400 feet from the shore along the conduits. Although offshore activities would be visible from Critical Public Views, such activities would be temporary and would not create a permanent impact to a scenic resource. Following the completion of this alternative, which would permanently remove prominent onshore structures same as the Proposed Project, the coastal viewshed would be notably improved from existing conditions.

Cumulative Impacts

The Full Removal of Offshore Conduits Alternative would increase the visual quality of the coastal viewshed, thereby resulting in a beneficial impact to aesthetics. This alternative would not have a significant adverse cumulative effect on aesthetics.

Air Quality

Environmental Impact Analysis and Mitigation

The baseline, regulatory setting, and significance criteria for the Full Removal of Offshore Conduits Alternative are identical to those described for the Proposed Project in Section 4.3, *Air Quality*. This analysis evaluates the same air quality impacts analyzed for the Proposed Project. The focus of the analysis is on the differences between the alternative and the Proposed Project. Where the significance of an impact for this alternative and the Proposed Project are the same, the reader is referred to Section 4.3.

Impact AQ-1: Conflict or Obstruct Implementation of Applicable Air Quality Plans.

The Full Removal of Offshore Conduits Alternative could conflict with or obstruct implementation of the San Diego Air Pollution Control District (SDAPCD) air quality plans or County of San Diego General Plan **(Less than Significant)**.

Onshore impacts from the Full Removal of Offshore Conduits Alternative would be the same as the Proposed Project. This alternative would also be completed in compliance with applicable air quality rules and regulations and in compliance with appropriate planning policies. Impacts related to conflicting with or obstructing implementation of applicable air quality plans would be less than significant.

Impact AQ-2: Violation of Ambient Air Quality Standards.

The Full Removal of Offshore Conduits Alternative could result in criteria pollutant emissions that cause or substantially contribute to a violation of an Ambient Air Quality Standard (AAQS) **(Less than Significant)**.

This alternative would increase criterial pollutant emissions. However, the majority of these emissions increases occur either offshore of the SONGS site, at the Ports of Los Angeles/Long Beach (Ports), or along the decommissioning waste transportation route to La Paz, Arizona. Therefore, given that these emissions increases occur offshore or are distributed over a large area, the emissions from this alternative would not be of a magnitude to substantially affect the air pollutant concentrations that are measured at the ambient air quality monitoring stations located within San Diego County, near the Ports, or located in nearby Orange County. Therefore, impacts would be less than significant.

Impact AQ-3: Result in a Cumulatively Considerable Net Increase of Any Criteria Air Pollutant for which the Project Region is in Nonattainment.

The Full Removal of Offshore Conduits Alternative could create NO_X pollutant emissions within the SDAPCD, SCAQMD, and MDAQMD jurisdictions that exceed thresholds **(Significant and Unavoidable)**.

The Applicant estimated peak emissions during the worst-case scenario for the Full Removal of Offshore Conduits Alternative. The methodologies for this estimate were consistent with the emissions estimate for the Proposed Project and included verification of reasonable assumptions and proper calculation methods. Appendix E2 provides final emissions estimates for the Full Removal of Offshore Conduits Alternative. Table 5-3 provides final worst-case daily emissions estimates for the onshore work peak period, estimated to occur in 2023, compared to the significance thresholds.

Table 5-3. Full Removal of Offshore Conduits Alternative Emissions

Unmitigated Peak Daily Emissions by Jurisdiction (pounds/day)	VOC	NO_X	CO	SO_x	PM_{10}	$PM_{2.5}$
San Diego County						
Total Maximum Daily Emissions	55.94	**474.56**	372.86	0.69	43.16	24.43
Screening-Level Thresholds	75	250	550	250	100	55
Significant?	No	**Yes**	No	No	No	No
South Coast AQMD						
Total Maximum Daily Emissions	33.86	**338.25**	161.09	0.94	39.87	15.01
Screening-Level Thresholds	75	100	550	150	150	55
Significant?	No	**Yes**	No	No	No	No
Mojave Desert AQMD						
Total Maximum Daily Emissions	4.54	**122.72**	36.29	0.28	6.68	3.49
Screening-Level Thresholds	75	100	550	150	150	55
Significant?	No	**Yes**	No	No	No	No
Imperial County APCD						
Total Maximum Daily Emissions	0.03	0.80	0.15	0.01	0.17	0.05
Screening-Level Thresholds	75	100	550	150	150	55
Significant?	No	No	No	No	No	No

Sources: Emission - Appendix E; Significance Thresholds - County of San Diego 2007b, SCAQMD 2015, Imperial County APCD 2007.
Acronyms: APCD = Air Polution Control District; AQMD = Air Quality Management District; CO = carbon monoxide; NO_X = oxides of nitrogen; $PM_{2.5}$ = particulate matter with an aerodynamic diameter $\leq$ 2.5 microns; PM_{10} = particulate matter with an aerodynamic diameter $\leq$ 10 microns; SO_x = oxides of sulfur; VOC = volatile organic compounds.
Note: The emissions estimate is a maximum peak daily rate. These peak daily rates are used to compare to the San Diego County hourly and annual emissions significance thresholds.

As shown in Table 5-3, the daily emissions of NO_X for the Full Removal of Offshore Conduits Alternative exceed the screening-level thresholds for emissions within San Diego County (SDAPCD) and the SCAQMD and MDAQMD jurisdictions. The worst-case

emissions are substantially greater in San Diego County and within the SCAQMD jurisdiction due to a large increase in maximum daily marine activities and associated waste-removal activities required for full conduit removal.

APM-3 and MMs AQ-3a and AQ-3b, unchanged from how they are listed in Section 4.3, would control the NO_X emissions from this alternative to the maximum feasible extent. While these mitigation measures would reduce the Proposed Project's NO_X emissions, those emissions, specifically the daily NO_X emissions within SCAQMD, MDAQMD, and SDAPCD jurisdictions, would remain above the screening-level emissions thresholds. Therefore, the residual impacts would remain significant and unavoidable.

Impact AQ-4: Expose Sensitive Receptors to Substantial Pollutant Concentrations.

The Full Removal of Offshore Conduits Alternative could expose sensitive receptors to substantial pollutant concentrations **(Less than Significant)**.

Impact Discussion. Similar to the Proposed Project, given the distance to sensitive receptors and their direction from SONGS, the on-site and offshore diesel particulate matter (DPM) emissions for this alternative are not of a magnitude that could create significant air toxic risks to the nearest sensitive receptors. Similarly, the other pollutant emissions are not of a magnitude that could create substantive pollutant concentrations at sensitive receptor locations. In addition, the Applicant has included APM-3 through APM-7 to further lower pollutant concentrations. Therefore, the air pollutant emissions from this alternative would not result in a significant impact on sensitive receptors. Furthermore, MM AQ-3a and MM AQ-3b recommended under Impact AQ-3 would further reduce the alternative's adverse, but less than significant, sensitive receptor impacts related to significant DPM emissions.

Impact AQ-5: Create Objectionable Odors Affecting a Substantial Number of People.

The Full Removal of Offshore Conduits Alternative could create objectionable odors affecting a substantial number of people **(Less than Significant)**.

Impact Discussion. This alternative would have the same types of odor sources as the Proposed Project, with an increase in the potential odors resulting from marine organism decomposition due to the increased amount of underwater conduit decommissioning wastes. However, as with the Proposed Project, due to the types of odor sources and the distance to odor receptors, a less-than-significant impact related to objectionable odors would occur.

Cumulative Impacts

Due to the distance between the Proposed Project site and the seven nearby cumulative projects (located within 1 mile of the Proposed Project site), see Section 4.3.5, *Air Quality – Cumulative Impacts,* and Table 3-2, the type and size of the proximate cumulative projects, and distance to nearby sensitive receptors, the cumulative effects for this alternative have been determined to be less than significant for the following impacts, similar to the Proposed Project:

- The Full Removal of Offshore Conduits Alternative would not have significant odor sources, and so could not create a considerable contribution to odor impacts (Impact AQ-5).
- The Full Removal of Offshore Conduits Alternative emissions are not of a magnitude that could combine with the emissions from the other proximate cumulative projects to cause new or substantially worsen existing AAQS violations (Impact AQ-2).
- The Full Removal of Offshore Conduits Alternative emissions would not create considerable contributions to significant localized health risk impacts or provide a considerable contribution to other localized substantial pollutant concentrations at sensitive receptor locations (Impact AQ-4).

Furthermore, impacts related to conformance with relevant air quality plans and policies (Impact AQ-1) is a Proposed Project-specific impact and is not a cumulative impact issue.

This alternative would create mitigated NO_X emissions levels from truck traffic, rail traffic, and marine vessels within San Diego County, SCAQMD, and MDAQMD jurisdictions that exceed screening-level emissions thresholds (Impact AQ-3). The alternative's emissions within the MDAQMD jurisdiction are along linear waste transport routes, routes that are over 200 miles, so the localized emissions would be minimal and would not cause significant cumulative emissions impacts within MDAQMD's jurisdiction. The alternative's substantive NO_X emissions contributions within San Diego County or SCAQMD's jurisdiction could combine with the air quality effects from the cumulative projects listed in Table 3-2 that are within these two jurisdictions. The measures to reduce NO_X impacts, APM-3, **MM AQ-3a**, and **MM AQ-3b**, reduce the alternative's emissions to the maximum feasible extent, and no additional mitigation would address the alternative's significant and unavoidable cumulative NO_X emissions impacts within San Diego County and SCAQMD jurisdictions.

Biological Resources

As discussed at the beginning of Section 5.4.2.2 under *No Change in Impacts*, activities for the Full Removal of Offshore Conduits Alternative only differ from the Proposed Project as it relates to conduit decommissioning offshore. Therefore, Impacts BIO-1

(Contribute to the Loss and Degradation of Sensitive Habitat), BIO-2 (Adversely Affect Terrestrial Special-Status Species), BIO-3 (Disturb Non-Listed Roosting or Breeding Bats), BIO-4 (Potential Disturbance or Degradation of Onshore Waters of the U.S./Waters of the State), BIO-5 (Interfere with Established Native Resident or Migratory Wildlife Corridors), and BIO-6 (Conflict with Adopted Conservation Plans) are the same as the Proposed Project, as discussed in Section 4.4, *Biological Resources*, and are not further discussed below.

Environmental Impact Analysis and Mitigation

The baseline, regulatory setting, and significance criteria for the Full Removal of Offshore Conduits Alternative are identical to those described for the Proposed Project in Section 4.4, *Biological Resources*. This analysis evaluates the same marine biological resource impacts analyzed for the Proposed Project. The focus of the analysis is on the differences between the alternative and the Proposed Project. Where the significance of an impact for this alternative and the Proposed Project are the same, the reader is referred to Section 4.4.

Marine Resources

Environmental Impact Analysis and Mitigation

Impact BIO-7: Contribute to Degradation of Marine Habitats.

Shore-based decommissioning activities could degrade marine habitats due to contaminated runoff **(Less than Significant)**.

Impact Discussion. Any differences in shore-based activities between the Full Removal of Offshore Conduits Alternative and the Proposed Project are minor with respect to the potential for runoff of pollutants into the marine environment. The major differences that could increase this impact are the increased construction time and the additional equipment required, which could increase the likelihood or magnitude of pollutants accumulating on surfaces; however, this is not anticipated to have a major effect on the degree of impact such that the determination of impact severity would change. As with the Proposed Project, this impact would be considered significant because runoff containing significant amounts of pollutants has the potential to affect ecologically important and biologically significant species; however, implementation of APM-1, APM-12, and APM-17 would reduce this impact to a less-than-significant level.

Impact BIO-8: Risk of Oil Spill Mortality to Regulated Marine Species.

The presence of vessels used for decommissioning activities could result in an oil or fuel spill **(Less than Significant)**.

Impact Discussion. There is a slightly greater risk of oil spills occurring for the Full Removal of Offshore Conduits Alternative relative to the Proposed Project, in part due to the longer construction period and increased vulnerability of vessels to grounding that are operating in the area. These activities include the piling operations associated with the construction of the trestle, as well as the extended period of time to excavate, remove the conduits, and backfill the void areas created by the removal. During this time, vessels are susceptible to weather conditions or equipment malfunction, particularly engine failure, which could result in the grounding of vessels and subsequent spill risk. Consequences of a spill are the same as those for the Proposed Project, although the likelihood is slightly amplified, increasing the level of risk of an impact. This impact is considered less than significant because the risk of a spill is still low and vessels would be required to conduct operations under an Offshore Spill Response Plan (APM-17).

Impact BIO-9: Release of Hydrogen Sulfide (H_2S) Gas from Intake and Discharge Conduits.

Anaerobic water containing H_2S gas released from the intake and discharge conduits during decommissioning could cause mortality of marine organisms **(Less than Significant with Mitigation)**.

The Full Removal of Offshore Conduits Alternative could release water from inside the conduits that could be anaerobic and release H_2S gas that may have formed inside the conduits. The possible anaerobic conditions in the conduits may provide an environment where sulfur-reducing bacteria could result in the production of H_2S gas, and the likelihood for production of gas would increase the longer the conduits remain stagnant prior to the removal of the structures. The release of anaerobic water from the conduits during the removal of the structures has the potential to affect a wide range of organisms near the release site and could cause immediate mortality to organisms that come into direct contact with the water when it is released due to the low levels of oxygen in the water. Indirect effects could include latent mortality of organisms or reduction in food resources for other organisms in the area. Additionally, any H_2S gas that formed in the system would rise to the surface and affect any organisms that come in contact during the release, including marine mammals, sea turtles, and any humans working or recreating on the water surface. Furthermore, the H_2S gas would also mix with the oxygen in the ambient water causing the precipitation of sulfur to the bottom, which could affect any benthic communities contacted.

As with the Proposed Project, the potential impact to listed species from the release of H_2S gas would be reduced to a less-than-significant level through implementation of MM BIO-9, which would require inspection and development of a H_2S Gas Control Plan if H_2S gas occurs at sufficient levels to pose a danger of release and subsequent mortality of listed marine species.

Impact BIO-10: Seabed Disturbance, Dredging, and Debris Accumulation.

Seabed disturbance during excavation, structure removal, and anchoring activities could cause destruction of marine habitat and mortality to marine organisms **(Significant and Unavoidable)**.

Impact Discussion. As discussed under the Proposed Project, communities associated with vertical structures to be removed would be lost. However, these communities would not exist if it were not for the artificial structures; therefore, their removal was not considered in this impact assessment.

The Full Removal of Offshore Conduits Alternative would result in a greater intensity and duration of seabed disturbance relative to the Proposed Project. This seabed disturbance would result in the suspension of sediment and turbid water conditions that are deleterious for marine life, particularly less mobile species such as algae, surfgrass, benthic invertebrates, and fishes that have restricted mobility, such as those that associate with burrows. Despite the greater turbidity under this alternative, as well as other associated consequences of a large volume of suspended sediment in the water column, any effects to sensitive communities (i.e., surfgrass or benthic fauna) are likely to be short term, and natural recovery from these effects would be anticipated within a short period of time after the activities cease.

The spatial extent of the turbid conditions resulting from seabed disturbance would also be limited, and turbid plumes would disperse quickly (within a day) after seabed disturbance activities cease. Waves and currents in the area would help disperse the sediment, reducing the effects in any one area as work progresses along the conduit corridors. Finally, the highly mobile nature of most fishes, all sea turtles, and all marine mammals would allow them to avoid the area of these localized and short-term effects. Although the effects are likely to be greater for this alternative compared to the Proposed Project, with the inclusion of APM-9, APM-15, and APM-16, as well as MM BIO-10, impacts due to turbidity to marine species and habitats would be less than significant.

Compared to the Proposed Project, the Full Removal of Offshore Conduits Alternative would have considerably greater impacts to seabed communities due to smothering as the conduits are excavated. This is in large part due to side-casting activities, which would deposit sediment and rock armoring along a large area of seabed next to the conduits. Both surfgrass and kelp communities exist near the intake and may be directly affected by the side-casting of material on top of these important habitat areas. Subsequently, the areas of kelp and surfgrass habitat that are smothered would be lost and organisms that directly benefit from these habitats would be forcibly displaced to other areas, resulting in competition for space and food with similar organisms in these other areas. The types of organisms that are likely to be displaced are quite mobile, such as non-burrow forming fishes, lobster and crabs, and squid. Some less mobile or entirely sedentary organisms

such as encrusting bryozoans, juvenile lobsters inhabiting surfgrass beds, and invertebrate grazers such as Kellet's whelk or abalone would be unable to rapidly vacate areas prior to disturbance and are likely to be directly affected by side-casting activities.

While side-casting is a feature of the Proposed Project and the effects are similar, complete removal of conduits for this alternative represents a significantly larger potential loss of submerged habitats and associated biological resources. After excavation and conduit removal activities are complete, side-cast material would be returned as fill material for the void left by each conduit, allowing for some long-term recovery within and around the conduit corridors where excavation would have also destroyed existing communities. While it is uncertain how rapidly recolonization may occur, recovery would occur eventually. Returning the seabed profile by infilling the void left by the removal of the conduits is likely to assist in this recovery, and it is highly unlikely that the habitat that may return would be considerably different to the habitat present prior to excavation and side-casting activities. There are no habitats on, or immediately adjacent to, the conduits that are unique in the local area. Because similar habitat exists adjacent to the areas that would be affected, recolonization from those areas for many species would occur, either by adult, juvenile, larval, or spore stages arriving at the disturbed areas.

Soft sediment communities, which constitute the largest extent of the area likely to be disturbed or destroyed by excavation or direct smothering by side-cast material are more able to adapt to deposition of sediments than the other benthic habitat types in the area. Burrowing organisms and epifauna that live on and in soft sediment habitats are typically well adapted to an environment that periodically experiences disturbance because the dominant medium is loose and subject to natural movement. However, most of the organisms which do not move away from the area during excavation and side-casting, such as much of the infauna and the sedentary epifauna, are unlikely to recover from the rapid deposition of several feet of material expected to be experienced in the middle of the side-cast footprint during this activity. It is more likely that the side-cast footprint and the conduit corridor, once re-filled, would be initially re-colonized by organisms that include some mobile adults, but mostly pelagic larval forms. The composition of infaunal communities are significantly affected by sediment grain size, independent of depth; therefore, the backfill material used to return the seabed profile to a similar level prior to the excavation of the conduits should be similar in grain size composition to ensure a similar infaunal community is reestablished. Ideally, any imported fill material would be deposited at the bottom of the trench and side-cast material would be placed on top to best mimic the original grain composition and help promote community recovery.

As described above, the effects of the Full Removal of Offshore Conduits Alternative would affect a considerably larger spatial area than the Proposed Project and includes habitats of biological significance, such as surfgrass. Under this alternative, the dredging of large sections of seabed is required to access the buried conduits. Inshore of the intake structures, this seabed is likely to include surfgrass patches. Surfgrass is a type of

seagrass, which is described as Essential Fish Habitat under the Magnuson-Stevens Fishery Conservation and Management Act. Recovery of this habitat within 6 months of removal is highly unlikely and, therefore, this impact would be significant and unavoidable. The refilling of the void left after the removal of the conduits would allow some recovery over the long term; however, the nature of that recovery is impossible to predict with a reasonable degree of certainty.

Impact BIO-11: Harassment of Marine Life.

Decommissioning activities would generate noise above and below the water surface that could result in disturbance of marine life. In addition, vessel traffic could result in inadvertent vessel collision with listed species **(Less than Significant with Mitigation)**.

Impact Discussion. Noise effects from boat engines and general construction activities during the Full Removal of Offshore Conduits Alternative would include similar effects to marine biology as the Proposed Project. However, the magnitude of these impacts would increase as a result of the longer construction window and level of offshore construction activities under this alternative. Pile driving to install the trestle supports and the sheet piling associated with the removal of the culverts onshore would generate considerable additional noise compared to the Proposed Project. In addition, the removal of the offshore conduits would involve breaking the conduits into sections small enough to fit on a barge for transport to a port. The conduit would most likely be cut into sections using saws. Noise generated from cutting would be comparable to that of the removal of vertical structures under the Proposed Project, although the magnitude of this impact is substantially greater due to the longer period of time over which these activities would occur compared to the Proposed Project.

The impacts from this alternative also differ from the Proposed Project in that the use of impact or vibratory hammers would be required to install the trestle pilings. This would result in the generation of increased noise levels that have the potential to cause auditory injury to and behavioral harassment of fish, sea turtles, seabirds, and marine mammals, (see Appendix F3). The following pile driving scenarios were modeled for this alternative:

- Unattenuated: piles driven to their final depth with a diesel impact hammer or vibratory hammer
- Attenuated: piles driven to their final depth with a diesel impact hammer or vibratory hammer, and the application of an air bubble curtain
- Unattenuated (50%): piles driven 50% of the way with a vibratory hammer and to their final depth with a diesel impact hammer
- Attenuated (50%): piles driven 50% of the way with a vibratory hammer and to their final depth with a diesel impact hammer, and the application of an air bubble curtain

- Unattenuated (proofed): piles driven to near their final depth with a vibratory hammer and proofed with a diesel impact hammer

The difference between the unattenuated and attenuated scenarios presented above is the use of a bubble curtain, which is commonly used to reduce noise from impact pile driving. These scenarios are referenced below as they relate to the potential noise impacts to marine wildlife as a result of pile driving. (See Appendix F3 for impact and vibratory pile driver information, source levels based on pile type, and underwater noise fundamentals.)

Fish

Potential impacts to fish resulting from pile driving were modeled based on injury and behavioral noise thresholds to determine the extent of these effects to fishes in nearby soft sediment and rocky reef habitats. Appendix F3 provides information regarding the underwater acoustic thresholds for fish used in this analysis. There are no formal acoustic criteria for fish for vibratory pile driving; therefore, only impact pile driving was modeled. Vibratory pile drivers generally produce less sound than impact pile drivers and are often employed as a mitigation measure to reduce the potential for adverse effects on marine species that can result from impact pile driving (Caltrans 2015a). As such, this analysis is considered conservative.

The modeled injury thresholds for fish (peak sound pressure level (SPL): 206 dB_{peak}; and cumulative sound exposure level [SEL_{cum}]: 183 dB) were greatest for the unattenuated 36-inch impact pile driving scenario (worst-case scenario) (18 meters [m] [59 feet] and 1,595 m [5,233 feet]) and smallest for the unattenuated (proofed) 24-inch impact pile driving scenario (<10 m [<33 feet] and 25 m [82 feet]). Under the worst-case scenario, no persistent kelp reefs, including San Onofre Kelp (the closest persistent kelp bed to the pile driving activity area) would experience noise levels exceeding the 206 dB_{peak} and 183 dB SEL_{cum} thresholds; however, fish associated with soft bottom habitat within 1,595 m (5,233 feet) of pile driving may experience injurious noise levels.

The modeled behavioral threshold for fish (150 dB_{rms} SPL) was greatest for the unattenuated 36-inch impact pile driving scenario (worst-case scenario) (7,356 m [24,134 feet]) and smallest for the attenuated or attenuated (50%) 24-inch pile driving scenario (736 m [2,415 feet]). Under the worst-case scenario, noise levels exceeding the behavioral noise threshold would encompass the San Mateo, Wheeler North, San Onofre Kelp, and Barn Kelp reefs, which are habitats for numerous resident fish species. This area encompasses a considerably larger area (more than twice the area) than what was calculated for the 24-inch attenuated (50%) and attenuated impact pile driving scenarios.Trestle piles would be installed in areas of soft sediment habitat, which would expose fish associated with this habitat type to increased underwater noise levels, irrespective of the type of piles and attenuation methods described in Appendix F3. Soft

sediment habitat is numerically dominated by fishes from the croaker, surfperch, and flatfish families. Rocky reefs, particularly those that include stands of giant kelp, are not found immediately adjacent to the proposed pile driving site and typically contain many more species of fishes in higher abundance than sandy seabed areas. Some fishes may aggregate close to the above-bed intake structures and the manhole covers. Fish species common to these habitat areas are listed and described in Section 4.4.3.6, *Fishes*.

No federal- or state-listed threatened, endangered, or candidate species are amongst the fishes associated with soft sediment or rocky reef habitats expected to be affected by noise impacts from the Full Removal of Offshore Conduits Alternative. However, many fishes associated with these habitats are targeted and caught by recreational anglers, particularly beach fishermen, and some are fished commercially. Therefore, fish species that are recognized as biologically or economically significant in federal, state, or local policies, statutes, and regulations are likely to be affected by noise impacts. However, it is unlikely that noise-injury effects would result in either a tangible decline in fishery catches by recreational or commercial fishermen, or observable declines in fish abundance in the local area. Additionally, it is expected that fish temporarily displaced from the area as a result of pile driving noise would return to the area shortly after these activities have ceased. Therefore, noise effects to fishes caused by the anticipated trestle piling activities are not considered to result in a significant impact.

Sea Turtles

For the unattenuated 36-inch impact pile driving scenario, the distance to the 210 dB SEL_{cum} injury threshold would be 25 m (82 feet) and the distance to the 207 dB_{peak} injury threshold would be 16 m (52 feet). Distances to both the peak SPL and cumulative SEL thresholds would be less than 10 m (32 feet) for all other scenarios. In the absence of behavioral impact thresholds for sea turtles, the National Marine Fisheries Services' Level B harassment threshold for impulsive sound (160 dB_{rms}) was used. This threshold would be exceeded for all pile driving scenarios, with the largest area of impact (1,585 m [5,200 feet] for the unattenuated 36-inch impact pile driving scenario. As described in Section 4.4.3.7, *Sea Turtles*, sea turtles are unlikely to occur within the Project area. Should they occur, any disturbance to these protected marine animals would constitute a "take" of a protected species under Federal Endangered Species Act. This would be considered a significant impact; however, this impact would be reduced to less than significant with the inclusion of ALT MM BIO-11a through BIO-11d and MM BIO-11.

Seabirds

There are no formal underwater acoustic thresholds for birds; however, an injury threshold of 202 dB SEL_{cum} was recommended for marbeled murrelets for impulsive noise (e.g., impact pile driving), which was used for this analysis as it may be applicable to birds similar in size. The greatest distance to the injury threshold would be 63 m (207 feet) for

the unattenuated 36-inch impact pile driving scenario and the smallest distance would be less than 10 m (32 feet) for the attenuated and attenuated (proofed) 36-inch pile driving scenarios. For the 24-inch-diameter steel shell piles, the distances to the cumulative SEL threshold would be 39 feet (12 meters) for the full installation/ unattenuated scenario; and less than 32 feet (10 meters) for all other scenarios.

The estimated distances to the in-air acoustic threshold for seabirds were 15 m (<50 feet) and 130 m (426 feet) for hearing damage and temporary threshold shift (TTS) thresholds, respectively. Per Dooling and Popper (2007), noise levels from continuous sources (e.g., vibratory pile driving) do not reach levels capable of causing auditory damage and/or permanent threshold shifts (PTS) based on empirical data on hearing loss in birds from the laboratory. Therefore, only the distance to the TTS threshold was calculated for vibratory pile driving, which was approximately 36 m (118 feet).

As described for the Proposed Project, disturbance of seabirds from their natural foraging and resting activities may occur. However, as discussed in the impact analysis for the Proposed Project, the highly mobile nature of seabirds makes them more resilient to the temporary and relatively localized noise effects that would be generated during decommissioning activities, and the same is to be expected for pile driving. Therefore, impacts to seabirds would be less than significant.

Marine Mammals

Marine mammals occurring near the Proposed Project site may experience Level A harassment as a result of noise generated by pile driving under this alternative. At the Proposed Project site, low-frequency cetaceans (humpback and gray whales), high-frequency cetaceans (harbor porpoises), phocid pinnipeds (harbor seals), and otariid pinnipeds (California sea lions) are most likely to occur.

Distances to peak SPL PTS thresholds for these species were less than 10 m (33 feet) for all modeling scenarios. The largest distances to cumulative SELs thresholds for harbor seals (a phocid pinniped) and California sea lions (an otariid pinniped) would extend to 534 m (1752 feet) and 39 m (128 feet), respectively, for unattenuated 36-inch piles driven with an impact hammer. Both species are likely to occur within these distances; however, individual animals may temporarily leave the area due to offshore activities occurring under this alternative. The size of the potential area affected for harbor seals may limit their ability to move a sufficient distance from the noise source and, therefore, harbor seals could be subject to injurious noise levels during unattenuated impact pile driving. California sea lions would be less likely to experience potentially injurious noise levels as the cumulative SEL PTS threshold is close to the noise source, in addition to the species' ability to quickly exit the potentially affected area.

While low-frequency cetaceans are considerably less likely to occur in the area, the cumulative SELs above which potentially injurious noise levels could occur would extend

to 999 m (3,276 feet) from the noise source. Some of the more commonly occurring low-frequency cetaceans such as the gray whale and humpback whale could occur within this distance. These cetaceans may try to leave the area if noise levels cause distress; however, the size of the area affected may limit their ability to move a sufficient distance from the noise source after the noise activity is initiated and, therefore, it is considered likely that low-frequency cetaceans could be subject to injurious noise levels during unattenuated impact pile driving.

Under the best attenuation scenario for phocid pinnipeds (24-inch piles, unattenuated [proofed]), the estimated distance to the cumulative SEL PTS threshold is 24 m (78 feet). At this distance, harbor seals are considerably more likely to be able to move to a distance where they would not be exposed to potentially injurious noise levels. For low-frequency cetaceans, the best attenuation scenario (24-inch piles, unattenuated [proofed]) results in a 24-m (78-foot) distance to the cumulative SEL PTS threshold. The unattenuated "proofed" scenario (the best attenuation scenario described above) entails piles being driven to near their final depth with a vibratory hammer and proofed with a diesel impact hammer (ALT MM BIO-11a). To further reduce distances to the PTS thresholds for harbor seals and low-frequency cetaceans an air bubble curtain (ALT MM BIO-11b) would be implemented. Additionally, a soft start (ALT MM BIO-11c) would be implemented during pile driving, which would result in the gradual increase of pile driving noise and may reduce the chance that a marine mammal would be startled by a change in the noise field and allow the animal to potentially move further from the sound source.

Marine mammal monitoring by National Marine Fisheries Service (NMFS)-certified marine mammal observers (MMOs) and acoustic monitoring is a common practice in California for addressing noise impacts from marine activities such as pile driving. Typically, an authorization permit for potential harassment of marine mammals and sea turtles is required following consultation with NMFS and the U.S. Fish and Wildlife Service (USFWS), respectively. During the consultation process, detailed information is required to ascertain the timing and type of work activities that would impact the behavior of marine mammals and sea turtles. Data from acoustic monitoring devices installed before and during construction activities are used to establish Level B behavioral harassment zones, where received underwater SPLs are higher than 160 dB_{rms} and 120 dB_{rms} for impulse noise sources (e.g., impact pile driving) and non-impulse noise sources (e.g., vibratory pile driving and mechanic dismantling), respectively (see Appendix F3). These zones are used by the MMOs in determining whether stop-work procedures need to be implemented for marine mammals and sea turtles active in the area. MMOs have the authority to halt activities that may generate high-amplitude impulse or continuous noise when sensitive species are close to noisy activities, which would allow these sensitive species time to depart the area under reasonably natural behavior. Without mitigation, impacts due to underwater noise levels affecting the behavior of marine mammals and sea turtles would be considered significant as these species would be directly affected. Direct effects such as mortality are unlikely due to noise, although disturbance of typical behavior could itself

be considered a direct effect and may result in indirect effects (e.g., reduced foraging success). Implementation of MM BIO-11, which would require the preparation of a Marine Mammal and Sea Turtle Mitigation and Monitoring Plan, in addition to ALT MM BIO-11d, which would require the preparation of an Exclusion Zone Monitoring Plan, would ensure that noise impacts to sensitive species would be reduced to a less-than-significant level.

ALT MM BIO-11a: Pile Proofing. To minimize predicted underwater noise (cumulative sound exposure levels) resulting from impact pile driving, the contractor shall be directed to vibrate the piles into the sediment to the extent practicable with a vibratory driver, and only use an impact driver when required for proofing to verify the load-bearing capacity of the piles.

ALT MM BIO-11b: Install Air Bubble Curtains. The Applicant or its contractor shall ensure proper design and deployment of an air bubble curtain attenuation system around impact pile driving operations.

ALT MM BIO-11c: Soft Start. To ensure that no Level A (injurious) harassment occurs, and that Level B (behavioral disruption) is reduced when pile driving activity occurs, the following soft start measures shall be implemented prior to the initiation of full-scale pile driving:

- For vibratory pile driving, the contractor shall initiate the pile driver at a reduced energy for 15 seconds followed by a 30-second waiting period, then two subsequent reduced energy strike sets.
- For impact pile-driving, the contractor shall “dry fire” the hammer (i.e., hammer blows where the fuel is turned off on the hammer and the piston is lifted and dropped) followed by a 30-second waiting period; this procedure is then repeated two additional times.
- A soft start shall be implemented before pile driving begins each day and any time following the cessation of pile driving for 30 minutes or longer.

ALT MM BIO-11d: Exclusion Zone Monitoring Plan. To ensure that no Level A (injurious) harassment or Level B (behavioral disruption) harassment occurs during pile-driving activities, the Applicant or its contractor shall coordinate with California State Lands Commission (CSLC) staff, in consultation with National Marine Fisheries Service, U.S. Fish and Wildlife Service, and California Department of Fish and Wildlife staffs, to develop an Exclusion Zone Monitoring Plan (Plan). The Plan shall include, at minimum, the following elements:

- Identify the Level B harassment (exclusion) zone for pile driving for marine mammals, sea turtles, or special-status marine bird species (sensitive species).
- Identify measures that will be taken if sensitive species are within or about to enter the established exclusion zone.
- Prior to initiation of Project activities that have the potential to generate noise sufficient to cause harassment of sensitive species (e.g., pile driving),

approved Marine Mammal Observers (MMOs) shall monitor the exclusion zone for the presence of sensitive species. If no sensitive species are sighted within the exclusion zone for 20 minutes, project activities may begin.

- If a sensitive species is sighted in the exclusion zone, or approaching the exclusion zone during this time, pile driving shall be delayed until the animal has left and no sensitive species have been sighted within the zone for another 20 minutes. After a sensitive species is seen in the exclusion zone and the animal has been observed leaving the exclusion zone, a soft-start in accordance with MM BIO-11c is required for piling activities.
- The approved MMOs shall record sightings of sensitive species and behavior of the animal within or near the exclusion zone during pile driving.
- Results shall be reported to CSLC staff no later than 30 days after pile driving is completed.

Impact BIO-12: Spread of Invasive and Non-Native Marine Species.

Vessels used during decommissioning activities could introduce invasive non-native marine species **(Less than Significant with Mitigation).**

Impact Discussion. The risk of transfer of invasive non-native (INN) species is slightly greater for the Full Removal of Offshore Conduits Alternative compared to the Proposed Project, primarily due to the increased use of vessels to remove the larger amount of infrastructure proposed. However, the transfer of INN species between potential INN species hotspots, such as harbor facilities, and the Proposed Project location is unlikely due to the short periods of time the vessels are expected to stay within the harbors during construction, and the ballast water management controls imposed by port facilities; however, with the inclusion of MM BIO-12, the impact would be less than significant.

Cumulative Impacts

Similar to the Proposed Project, none of the planned or proposed projects identified for assessment of cumulative effects are immediately offshore of SONGS, and none of the effects of these projects, when considered together with the Proposed Project effects, would combine to produce a significant cumulative impact on the marine environment. As discussed for the Proposed Project, MM BIO-12 would minimize impacts associated with invasive or non-native marine species. Therefore, the alternative's potential contribution to cumulative impacts on biological resources would not be cumulatively considerable.

Geology, Soils, and Coastal Processes

As discussed at the beginning of Section 5.4.2.2 under *No Change in Impacts*, activities for the Full Removal of Offshore Conduits Alternative only differ from the Proposed Project as it relates to conduit decommissioning offshore. Therefore, Impacts GEO/CP-1 (Construction Triggered Landslides) and GEO/CP-2 (Construction Triggered Erosion) are

the same as the Proposed Project, as discussed in Section 4.7, *Geology, Soils, and Coastal Processes*, and are not discussed below.

Environmental Impact Analysis and Mitigation

The baseline, regulatory setting, and significance criteria for the Full Removal of Offshore Conduits Alternative are identical to those described for the Proposed Project in Section 4.7, *Geology, Soils, and Coastal Processes*. This offshore analysis assesses the alternative's potential to violate regulatory standards, substantially alter bluff, beach, or nearshore sediment transport processes and characteristics, alter nearshore waves or currents, or adversely change tsunami impacts. The focus of the analysis is on the differences between the alternative and the Proposed Project. Where the significance of an impact for this alternative and the Proposed Project are the same, the reader is referred to Section 4.7, *Geology, Soils, and Coastal Processes*.

Impact GEO/CP-3: Impaired Coastal Sediment Properties.

Dredging, conduit removal, and returning the seafloor to the original profile would have no impact on coastal sediment properties, which is less of an influence than the Proposed Project **(No Impact)**.

Impact Discussion. The Proposed Project would result in a small, but negligible loss of sediment from the coastal littoral system because sediment would become trapped in the conduit, whereas this alternative would not change coastal sediment properties compared to baseline. No change in the littoral system characteristics leads to no change in other characteristics such as beach width, shoreline erosion, bluff erosion, and longshore sediment transport rates and patterns. This applies to areas fronting SONGS and upcoast and downcoast of SONGS, both immediately after demolition and in the long term. Since there would be no change from the baseline condition, there would be no impacts to coastal sediment properties under this alternative.

Impact GEO/CP-4: Degrade Water Waves, Currents, or Circulation Patterns.

Full removal of the offshore conduits could have effects on water waves, currents, and circulation patterns **(Less Than Significant)**.

Impact Discussion. The Proposed Project would result in a small, but negligible change to water wave, current, and circulation patterns. The Full Removal of Offshore Conduits Alternative would have no change in impacts from the Proposed Project. The changes to water waves, currents, and circulation in the Proposed Project arise from minor changes in bathymetry after localized dredging and partial removal of vertical structures above the seafloor. This alternative would remove more vertical structures and conduit beneath the seabed, but would not increase impacts to waves, currents, and circulation patterns. Therefore, this alternative would share the same impacts as the Proposed Project.

Impact GEO/CP-5: Increased Tsunami Threats.

This alternative would not measurably change tsunami inundation properties **(No Impact)**.

Impact Discussion. Being much smaller than the minimum resolution necessary for model input, the changes from either the Proposed Project or the Full Removal of Offshore Conduits Alternative would not modify tsunami model results nor change real life tsunami characteristics. Given the scale of the proposed changes, there would be no impact from decommissioning activities on tsunamis.

Cumulative Impacts

Similar to the Proposed Project, changes to the littoral sand supply from this alternative are negligible and less than significant. The alternative would have negligible effects on water waves, currents, circulation patterns, and tsunami threats, and no cumulative effects with other listed coastal projects. Therefore, the alternative would not make a considerable contribution to cumulative effects associated with coastal processes.

Greenhouse Gas Emissions

Environmental Impact Analysis and Mitigation

The baseline, regulatory setting, and significance criteria for the Full Removal of Offshore Conduits Alternative are identical to those described for the Proposed Project in Section 4.8, *Greenhouse Gas Emissions*. The focus of this analysis, which evaluates the same GHG emissions impacts analyzed for the Proposed Project, is on the differences between the alternative and the Proposed Project. Where the significance of an impact for this alternative and the Proposed Project are the same, the reader is referred to Section 4.8.

Impact GHG-1: GHG Emissions from Project Activities.

The Full Removal of Offshore Conduits Alternative's GHG emissions could exceed GHG emission significance criteria **(Less than Significant)**.

Impact Discussion. Table 5-4 presents the total GHG emissions for the Full Removal of Offshore Conduits Alternative compared to the annual GHG emissions significance threshold. The Full Removal of Offshore Conduits Alternative's GHG emissions estimate is based on currently proposed activities for full removal of the conduits, which SCE forecasts to occur over a 7-year period (2019 through 2025), where offshore removal activities would occur between 2022 through 2025. As shown in Table 5-4, the Full Removal of Offshore Conduits Alternative's GHG emissions would not exceed the annual emissions significance threshold. Therefore, the impacts would be less than significant.

Table 5-4. Full Removal of Offshore Conduits Alternative GHG Emissions

Emissions Source	GHG Emissions ($MTCO_2e$)[1]
Full Removal of Offshore Conduits Alternative Total Emissions[2]	62,373
Total Direct/Indirect Annualized Emissions[3]	8,910
Annual Significance Threshold	10,000
Exceed Significance Threshold	No

Source: Appendix E.
Acronym: CO_2e = carbon dixoide equivalent; GHG = greenhouse gas; MT = metric tons.
Notes:
[1] Emissions presented include terrestrial transportation emissions that occur within California, and include all proposed on-shore emissions and the offshore marine vessel emissions during the Full Removal of Offshore Conduits Alternative that are forecast to occur in the worst-case scenario.
[2] The extent of any additional onshore work will be determined by the DoN and is currently unknown.
[3] Total emissions are annualized by amortizing the total emissions as an annual average over the total active schedule for the Proposed Project, which is 7 years (2019 through 2025).

Impact GHG-2: Compliance with GHG Emission Reduction Plans, Policies, or Regulations.

The Full Removal of Offshore Conduits Alternative could conflict with GHG emissions reduction plans, policies, or regulations **(Less than Significant)**.

Impact Discussion. This alternative includes more intensive offshore decommissioning activities, but it does not change the types of emissions sources or increase regulated activities. Therefore, for the reasons noted for the Proposed Project, this alternative would not conflict with any applicable plan, policy, or regulation related to reducing GHGs, including those currently in the County of San Diego's Climate Action Plan or General Plan. Therefore, impacts would be less than significant.

Cumulative Impacts

As noted in Section 4.8.5, *Greenhouse Gas Emissions – Cumulative Impacts*, the impacts of GHGs differ from criteria pollutants (discussed in under Air Quality above) in that GHG emissions from a specific project do not cause direct adverse localized human health effects. Rather, the direct environmental effect of GHG emissions is the cumulative effect on climate change that results in an overall increase in global temperatures, which in turn has numerous indirect effects on the environment and humans. These indirect effects of climate change, depending on the region, timeframe, and metrics used to assess impacts, can solely or additively be adverse, benign, or beneficial. Given that the GHG emissions impacts are already analyzed as a global cumulative impact, additional cumulative impacts analysis was not performed.

Hydrology and Water Quality

As discussed in Section 5.4.2.2 under *No Change in Impacts*, activities for the Full Removal of Offshore Conduits Alternative only differ from the Proposed Project as related

to conduit decommissioning offshore. Therefore, Impacts WQ-1 (Violation of Water Quality Standards or Waste Discharge Requirements, or Generation of Substantial Additional Sources of Polluted Runoff), WQ-2 (Groundwater Characterization and Discharge), WQ-3 (Groundwater Depletion or Reduced Recharge), WQ-4 (Erosion or Siltation due to Altered Drainage Patterns), and WQ-5 (Flooding due to Altered Drainage Patters or Increased Surface Runoff) are the same as the Proposed Project, as discussed in Section 4.9, *Hydrology and Water Quality*, and are not discussed below.

Environmental Impact Analysis and Mitigation

The baseline, regulatory setting, and significance criteria for this alternative are identical to those described for the Proposed Project in Section 4.9, *Hydrology and Water Quality*. This analysis assesses the alternative's potential to violate relevant regulatory standards, and substantially alter hydrology and water quality. The focus of the analysis is on the differences between the alternative and the Proposed Project. Where the significance of an impact for this alternative and the Proposed Project are the same, the reader is referred to Section 4.9.4, *Environmental Impact Analysis and Mitigation*.

Impact WQ-6: Increased Ocean Turbidity and Marine Debris.

Offshore conduit decommissioning would result in increased turbidity and marine debris that could have temporary and localized impacts on marine water quality **(Less than Significant)**.

Impact Discussion. This alternative would involve several onshore (beach), nearshore, and prolonged or intensified offshore activities that would not occur under the Proposed Project. In addition, substantially more beach, nearshore, and offshore dredging and excavation would be required compared to the Proposed Project, resulting in an extended decommissioning schedule or intensified decommissioning activities to meet the Proposed Project's partial removal schedule. As such, additional crane barges would be needed, or the barges used for the Proposed Project would need to be anchored offshore for a longer period. Full removal of the conduits would also require additional barge trips to/from the POLB or another appropriate facility for disposal of conduit sections. Although this alternative would cause effects associated with Impact WQ-6 to be longer in duration or intensified by increased equipment, impacts to marine turbidity and marine debris would remain less than significant with implementation of APM-1, APM-15, and APM-16. With the inclusion of the APMs, impacts to marine water, sediment quality, and marine organisms would be less than significant under this alternative.

Impact WQ-7: Degraded Marine Water Quality from Oil or Chemical Spills.

Potential chemical spills in and adjacent to the ocean during facilities demolition could substantially degrade marine water quality **(Less than Significant).**

Impact Discussion. Under this alternative, the potential for land-based chemical spills would not substantially differ from that of the Proposed Project. The potential for chemical spills in and over water would increase due to the extended amount of water-based activities required as compared to that of the Proposed Project. Any degradation in marine water quality from chemical spills, would be limited in size, extent, and duration with implementation of APM-17, which would define procedures and protocols to be used in the event of an offshore spill or leakage of fuel or lubricants. With the inclusion of APM-17, impacts to marine water quality under this alternative would be less than significant.

Cumulative Impacts

As discussed for the Proposed Project, projects involving vessel traffic and marine seafloor activities would have the most potential for contributing cumulative effects to marine water quality. Of the projects identified with the potential to overlap with the Proposed Project, only the Wheeler North Reef Expansion, the Huntington Beach Seawater Desalination Project, and the Camp Pendleton Seawater Desalination Project are expected to include in-water construction activities that would overlap with the offshore demolition timeline for the alternative (e.g., during 2020). In-water activities for the Palos Verdes Reef Restoration project would precede and thus not overlap with the alternative, and cumulative impacts are not expected to occur as a result. The in-water activities for the Wheeler North Reef and seawater desalination projects must meet the regulatory requirements designed to be protective of marine water quality, including reducing the probability and consequences of accidental releases into the marine environment. Therefore, these cumulative projects are expected to contribute only negligible cumulative impacts associated with water quality.

Because the alternative is not within a groundwater basin and is not expected to adversely affect groundwater, its contribution to cumulative groundwater impacts are negligible.

Noise

Environmental Impact Analysis and Mitigation

The baseline, regulatory setting, and significance criteria for the Full Removal of Offshore Conduits Alternative are identical to those described for the Proposed Project in Section 4.11, *Noise*. The focus of the analysis is on the differences between the alternative and the Proposed Project. Where the significance of an impact for this alternative and the Proposed Project are the same, the reader is referred to Section 4.11, *Noise*.

Impact NOI-1: Expose Sensitive Receptors to Onshore Noise Levels in Excess of Standards.

The Full Removal of Offshore Conduits Alternative could expose persons to noise levels exceeding standards established in the local General Plan or Noise Ordinance, or applicable standards of other agencies **(Less than Significant)**.

Impact Discussion. The Full Removal of Offshore Conduits in Alternative would require a trestle to be installed in the surf zone for the removal of the vertical structures and conduits (to be removed as a whole unit). The surf zone limit was established at a depth of 29 feet around Station (STA) 39+00, which is located at an approximate distance of 2,925 feet from the zero contour (MLLW = 0 feet) at STA 9+75. Outside of the surf zone, the conduits would be extracted using a spud-anchored crane barge, which would provide stability in swells and surges from distant storms.

The marine equipment required to build the trestle piles and deck would be unique and site specific. The trestle construction would start from the offshore intake structure location and move incrementally towards shore. A mounted crane would be hoisted and assembled on the trestle after the first increment of construction. The conduit removal in the surf zone would be carried out using a crane and cradle horse assembly and move progressively towards shore. All concrete pipe sections would be hoisted to the water surface with diver support and floated to deep water. Support for this operation would be provided by the trestle crane and workboat. In deep water, the pipe would be hoisted with the assistance of two floating derrick barges onto a materials barge anchored at the intake structure and eventually towed to the POLB.

Onshore noise levels associated with the Full Removal of Offshore Conduits Alternative would be very similar or identical to the Proposed Project. As presented in Section 4.11, *Noise*, average and maximum sound levels from worst-case D&D activities would be 70 dBA (A-weighted sound level) and 71 dBA at the northwestern edge of the seawall walkway, 63 dBA to 65 dBA at the southern end of the State Surf Beach, and 53 dBA and 54 dBA at the closest residential uses on MCBCP. Noise levels at these closest receptors would not exceed the San Diego County Noise Ordinance or General Plan Noise Element limits, resulting in a less-than-significant impact.

Impact NOI-2: Expose Sensitive Receptors to Excessive Groundborne Vibration or Groundborne Noise.

Equipment used for the Full Removal of Offshore Conduits Alternative could generate substantial vibration, which may expose sensitive receptors to excessive groundborne vibration or noise levels **(Less than Significant)**.

Impact Discussion. Onshore vibration levels associated with the Full Removal of Offshore Conduits Alternative would be very similar or identical to the Proposed Project. As presented in Section 4.11, *Noise*, given the large distances (≥ 900 feet) between major work areas and sensitive use locations, maximum groundborne vibration levels from D&D activities would be well below perceptible levels at the nearest sensitive receptors locations. Therefore, vibration impacts would be less than significant.

Impact NOI-3: Substantial Temporary or Periodic Increase in Ambient Noise Levels at Sensitive Receptors.

The Full Removal of Offshore Conduits Alternative could result in substantial temporary or periodic increase in ambient noise levels at the closest noise sensitive use areas **(Less than Significant)**.

Impact Discussion. As stated above under Impact NOI-1, onshore D&D activities under the Full Removal of Offshore Conduits Alternative would be similar or the same as the Proposed Project and would not exceed ambient conditions at the closest sensitive noise receptors. However, offshore activities, including trestle installation and pile driving, would expose recreationists, especially those on the beach walkway fronting SONGS, to heightened ambient noise levels. While Table 4.11-9 shows that onshore impact and vibratory pile driving produces A-weighted maximum (Lmax) noise levels of 95 dBA at 50 feet, impact pile driving sound levels measured during the Navy Test Pile Project indicate that the measured un-weighted maximum (Lmax) level was 112 dB at 50 feet, and the maximum (Lmax) measured un-weighted vibratory pile driving sound level was 103 dB at 50 feet. Although not reported, A-weighted levels were likely about 5 dB lower at 107 dBA and 98 dBA at 50 feet for impact and vibratory pile driving, respectively.

The northwestern edge of the seawall walkway would be approximately 1,200 feet from the closest expected offshore trestle work, thus sound levels due to offshore trestle impact or vibratory pile driving may reach maximum levels of 80 dBA and 71 dBA, respectively. Based on pile driving usage factors of 20 percent from the Roadway Construction Noise Model (see Table 4.11-9), average noise levels from this activity would be 6 dB lower: 74 dBA for impact pile driving and 65 dBA for vibratory pile driving at the offshore trestle. These levels would not exceed the County noise ordinance limit for construction equipment (Section 36.409) and would be similar to current ambient conditions at the walkway. Therefore, this impact would be less than significant.

Impact NOI-4: Create Excessive Underwater Noise.

Offshore activities associated with the Full Removal of Offshore Conduits Alternative could expose sensitive receptors (humans) to excessive offshore noise levels **(Less than Significant with Mitigation)**.

Impact Discussion. For the Full Removal of Offshore Conduits Alternative, the primary source of underwater noise would be from driving steel guide piles to install the temporary trestle using an impact hammer, vibratory hammer, or combination of these hammers. A pile size between 24 and 36 inches in diameter would likely be used. (See Appendix F3 for impact and vibratory pile driver information, source levels based on pile type, and underwater noise fundamentals.) Table 4.11-11 (see Section 4.11, *Noise*) summarizes underwater thresholds for unprotected recreational divers. Studies have shown that high levels of underwater noise can cause dizziness, hearing damage, or other sensitive organ damage to recreational divers and swimmers and may elicit startle responses. Underwater noise levels in excess of 154 dB_{rms} could be considered potentially harmful to divers and swimmers. Table 5-5 shows the distances to the 154 dB_{rms} threshold for divers, swimmers, and surfers for underwater noise impacts for each pile driving scenario.

Table 5-5. Calculated Distance to Diver Safety Zone

Pile Size/Modeling Scenario	Distance to 154 dB_{rms} safety zone (feet)	
	Impact	Vibratory
36 inches (unattenuated)	13,061	384
36 inches (attenuated)	2,815	82
24 inches (unattenuated)	6,063	<33
24 inches (attenuated)	1,306	<33

Based on the information in Table 5-5 and Appendix F3 for unattenuated and attenuated (i.e., with an air bubble curtain) pile driving, noise levels in excess of the human safety threshold would be exceeded during construction of the temporary trestle. To ensure that potential noise impacts to divers, swimmers, surfers, or other persons underwater are avoided or reduced to a less-than-significant level, recreationists and local mariners would be notified per APM-18, MM REC-1a, and ALT MM NOI-4a, and safety zones established per APM-22 and ALT MM NOI-4b. In addition, implementing a properly designed and deployed air bubble curtain attenuation system (ALT MM BIO-11b) is expected to provide a minimum sound reduction of 10 dB (see Appendix F3).

Mitigation Measures

MM REC-1a: Public Notification (Section 4.12, *Recreation and Public Access*)

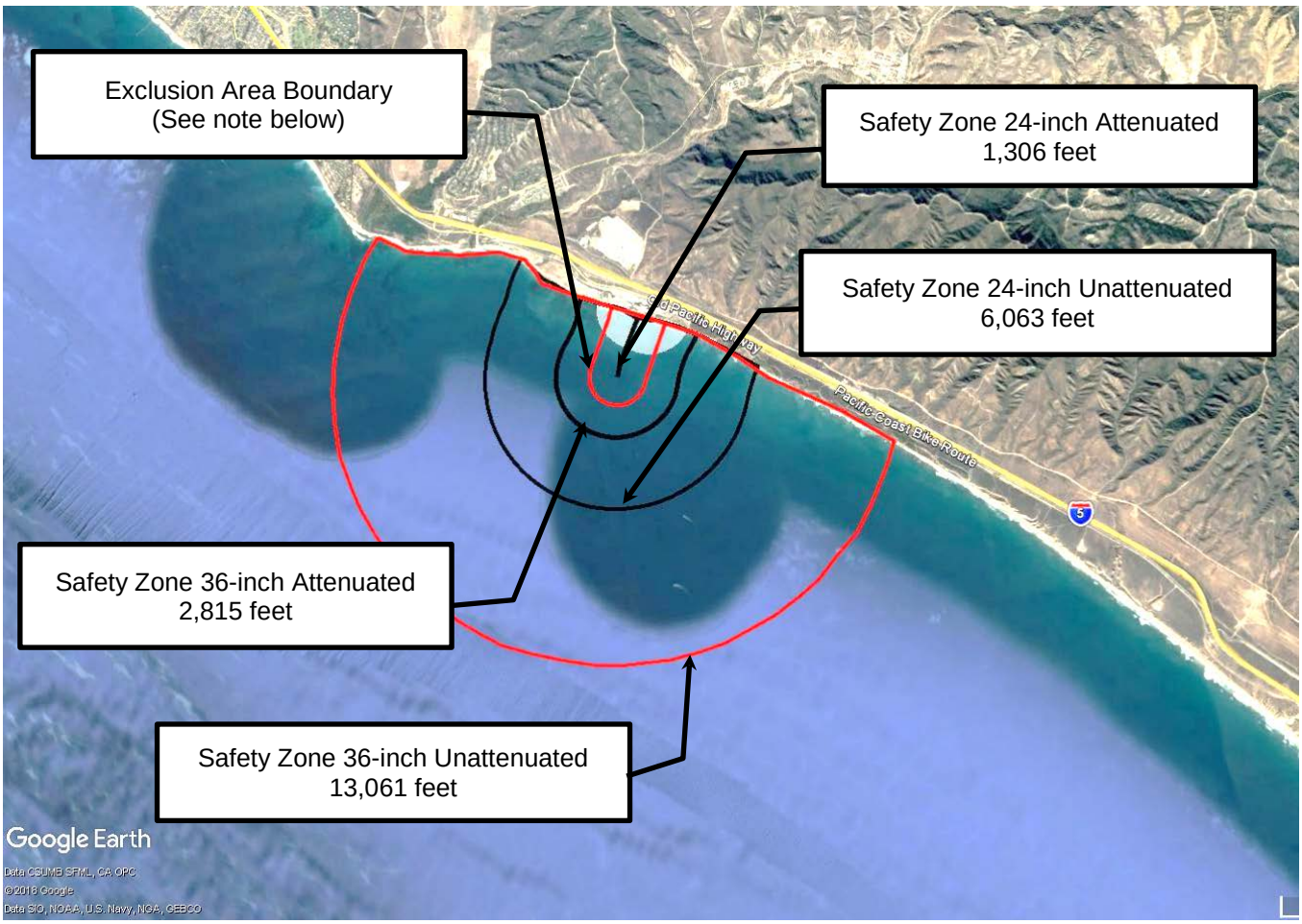
ALT MM BIO-11b: Install Air Bubble Curtains (see Impact BIO-11, above)

ALT MM NOI-4a: Advanced Notice to Swimmers and Divers. At a minimum of 1 week prior to pile driving for the temporary trestle, written notice to swimmers, surfers, and divers shall be posted at area dive shops and along the San Onofre State Beach, Trestles Beach, San Onofre Surf Beach, and Bluffs Beach indicating that swimming, surfing, and diving may be harmful due to underwater noise resulting from pile driving operations. The notice shall state that the Project area should be avoided during the pile driving period, which shall be identified on the notice along with a map showing the Project area and suggested area of preclusion for swimmers, surfers, and divers. The notice shall also provide a

contact name and phone number for Southern California Edison, for the public to call with questions, concerns, or complaints.

ALT MM NOI-4b: Establish Safety Zone. The Applicant or its contractor shall apply to the U.S. Coast Guard (USCG) for the establishment of a safety zone (see Figure 5-1) around the offshore work areas to allow enforcement of a safety zone to exclude the public from these areas during active offshore construction. Enforcement shall be determined by the USCG.

Figure 5-1. Pile Driving Exclusion Area and Safety Zones



Note: The Exclusion Area Boundary (EAB) is roughly formed by two semicircles with radii of 1,967.5 feet. each, centered on the Unit 2 Containment dome and a point located 134 feet southeast of the Unit 3 Containment dome, with a tangent connecting the landward arcs and seaward arcs of the two semicircles.

Cumulative Impacts

Similar to the Proposed Project, none of the planned or proposed projects identified for assessment of cumulative effects would generate noise impacts that, if combined with the noise levels of this alternative, would exceed San Diego County Code of Regulatory Ordinances. Therefore, the alternative would not have a significant cumulative contribution to temporary noise increases over ambient conditions.

Recreation and Public Access

Environmental Impact Analysis and Mitigation

The baseline, regulatory setting, and impact significance criteria for the Full Removal of Offshore Conduits Alternative are identical to those described for the Proposed Project in Section 4.12, *Recreation and Public Access*. This analysis assesses the alternative's potential to restrict public access to recreational facilities, increase the use of existing local and regional parks or other recreational facilities, and expose recreationalists to hazardous conditions. The focus of this analysis is on the differences between the alternative and the Proposed Project. Where the significance of an impact for this alternative and the Proposed Project are the same, the reader is referred to Section 4.12.4, *Environmental Impact Analysis and Mitigation*.

Impact REC-1: Reduction of Public Access to Recreational Facilities

Decommissioning activities could have temporary, intermittent adverse impacts on upland, shoreline, and water-dependent recreation **(Less than Significant with Mitigation)**.

Impact Discussion. The Proposed Project would not require any onshore or nearshore equipment laydown or work areas, whereas the Full Removal of Offshore Conduits Alternative would require the use of beach and nearshore areas, which would prohibit the use of the beaches, public access walkway, and nearshore waters flanking the Shoreline and Offshore Facilities (SOF) during decommissioning activities. These prohibitions would remain in effect until all SOF up to 300 feet offshore are removed, as well as the trestle, crawler crane, sheet pile barriers, and any beach staging areas.

Further offshore (greater than 300 feet seaward of the beach), the alternative would require either additional barges or an extended timeframe for barge anchoring and operation. Additional barge movement to/from the POLB or other appropriate facility would also be required, which could restrict recreational boaters.

Although the Full Removal of Offshore Conduits Alternative would cause effects associated with Impact REC-1 to be either longer in duration or intensified by increased decommissioning crews and equipment, implementation of APM-18 and MMs REC-1a and REC-1b would reduce impacts to shoreline and nearshore recreational resources to a less-than-significant level. For the same reasons as identified in Section 4.12.4, *Environmental Impact Analysis and Mitigation*, this alternative would have no impacts or less-than-significant impacts to surfers and upland recreational resources and facilities.

Impact REC-2: Increased Use of Existing Local and Regional Parks or Other Recreational Facilities

The influx of additional personnel for full SOF removal activities may cause the deterioration of existing local and regional parks or other recreational facilities, including campgrounds **(Less than Significant)**.

Impact Discussion. Implementation of the Full Removal of Offshore Conduits Alternative would either prolong activities associated with removal of the SOF or intensify decommissioning activities due to an increased workforce and need for additional equipment. However, for the same reasons as described in Section 4.12.4, *Environmental Impact Analysis and Mitigation*, impacts would be less than significant and no mitigation measures are recommended.

Impact REC-3: Create Hazards for Recreationists.

Recreational users could be potentially impacted by hazardous activities associated with full SOF removal **(Less than Significant with Mitigation)**.

Impact Discussion. Implementation of the Full Removal of Offshore Conduits Alternative would prolong or intensify decommissioning activities outside SONGS' boundaries. APM-18 and MM REC-1a would ensure that recreationists are kept clear of hazardous areas, thus avoiding potentially significant impacts to the safety of recreational users during full SOF removal. In addition, as suggested in the "San Onofre Nuclear Generating Station Units 2 & 3 Conduits Dispositioning Alternatives: Beneficial and Adverse Impacts Review" report (HDR and Coastal Environments, Inc. 2017), the trenches left after full removal of the conduits could create rip currents that could be a potential hazard to people recreating in the vicinity offshore of SONGS. Section 4.1, *Hazardous and Radiological Materials*, discusses the risk of radiological contamination and the potential for such an event to close local beaches and offshore areas, thereby preventing their recreational use.

Cumulative Impacts

As shown in Figure 3-2, only a few past, present, and reasonably foreseeable future projects fall within the Proposed Project area for recreation and public access. For the same reasons described for the Proposed Project in Section 4.13.6, *Cumulative Impacts*, the Full Removal of Offshore Conduits Alternative would not make a considerable contribution to cumulative effects associated with recreation and public access with implementation of APM-18 and MMs REC-1a and REC-1b.

Transportation and Traffic

Environmental Impact Analysis and Mitigation

The baseline, regulatory setting, and significance criteria for this alternative are identical to those described for the Proposed Project in Section 4.13, *Transportation and Traffic*. The focus of the analysis is on the differences in traffic and transportation impacts between the alternative and the Proposed Project. Where the significance of an impact for this alternative and the Proposed Project are the same, refer to Section 4.13.4, *Environmental Impact Analysis and Mitigation*.

Impact TR-1: Reduction of Local Transportation and Circulation.

Traffic generated by D&D activities could result in short-term adverse impacts on local transportation and circulation **(Less than Significant)**.

Impact Discussion. The Full Removal of Offshore Conduits Alternative would increase truck traffic to SONGS and to the POLB during the extended offshore removal activities, which are assumed to occur between 2022 through 2025. The additional trips to SONGS include material trips to construct and remove the trestles used during, and to haul waste from, the nearshore removals. The peak truck traffic year to SONGS would occur in 2024 with 88 truck trips (round trips) estimated to occur on a peak day during the worst-case period. This increase of 23 truck trips per day over the Proposed Project's peak daily estimate are related to the additional offshore removal work.

In 2024, the peak truck traffic year, the changes to LOS would not change appreciably from those determined for the Proposed Project. Delay times would negligibly increase from those that would occur due to the Proposed Project; however, the Full Removal of Offshore Conduits Alternative would not further degrade the LOS at any study intersections to below acceptable standards. Although impacts are less than significant, SCE has committed to implementing APM-19 and APM-20 to ensure that impacts associated with traffic would be further reduced. Additionally, MM REC-1b would further reduce impacts associated with traffic and public access to areas adjacent to the Proposed Project. Construction traffic associated with the alternative would have a less-than-significant impact on traffic operations at the study area intersections.

Impact TR-2: Reduce Pedestrian and Bicycle Rider Safety.

Construction vehicles could result in short-term adverse impacts on pedestrian and bicyclist safety **(Less than Significant with Mitigation)**.

Impact Discussion. No existing design features would compromise the operational safety of construction vehicles, and this alternative would not require modifications to existing county roads or the state highway system. As described above, during the

heaviest year (2024) of construction traffic, the Full Removal of Offshore Conduits Alternative would generate 88 construction trips (round trips) per day. Over a 10-hour work day, this would equate to eight to nine truck trips per hour (assuming they are evenly spaced out). Construction volumes would not significantly affect roadway operations (see Impact TR-1) nor do conditions exist that would affect the safety of vehicles operating along Old Pacific Highway and at the I-5/Basilone Road interchange.

Like the Proposed Project, implementation of this alternative may intermittently require the closure of segments of Old Pacific Highway so that construction personnel and equipment can access the site. This would require a temporary closure of the bicycle route and road shoulders adjacent to SONGS. As noted, pedestrian use of the road shoulders near SONGS is minimal. Because Old Pacific Highway is part of a designated bicycle route, temporary closures have greater potential to adversely affect bicyclists. MM REC-1a would require warning signs be posted notifying pedestrians and bicyclists of road closures and the location of detours. In addition, APM-21 would include coordination with California State Parks to ensure that appropriate steps (including alternative access routes) are taken to ensure continued pedestrian and bicyclist access and safety. With implementation of these measures, potential pedestrian and bicycle safety impacts associated with intermittent road closures would be less than significant.

Impact TR-3: Limit Rail Operations.

The use of rail service to dispose of D&D waste material could adversely affect operation of the LOSSAN and Transcontinental corridor **(Less than Significant)**.

Impact Discussion. Because the rail operations under the Full Removal of Offshore Conduits Alternative would be identical to the Proposed Project, potential impacts related to rail operations would be the same as described for the Proposed Project. Therefore, like the Proposed Project, 56 rail shipments are estimated to occur annually.

Between 5 and 15 rail cars would be generated per shipment, and rail cars would be hauled from SONGS to the Stuart Mesa Railyard to be combined with other Burlington Northern Santa Fe (BNSF) freight trains. From there, the rail cars would likely be transported north and then east to the San Bernardino Intermodal Yard, and then on to a disposal location in Clive, Utah or Oak Ridge, Tennessee. Freight trains operate at night after passenger service has terminated for the day and before it begins the next morning, typically between 11:00 p.m. and 4:00 a.m. Movement of D&D waste rail cars would be coordinated with BNSF and combined with planned train sets; therefore, this alternative would not generate demand for additional freight trains, would not adversely affect freight or passenger operations, and would not result in significant impacts on rail operations.

Impact TR-4: Reduce Driveway Safety or Require New Traffic Signals.

D&D traffic could adversely affect driveway safety or require a new traffic signal **(Less than Significant)**.

Impact Discussion. Potential impacts related to ~~o~~Onshore ~~s~~Site access safety would be similar to the Proposed Project because the site access would not change, only additional truck trips would occur during the peak period in 2024. The existing SONGS facility has two exit/entrance driveways providing vehicle access from Old Pacific Highway. This alternative would not reduce the LOS at these intersections to below acceptable standards; therefore, movement of D&D traffic through these intersections would not warrant the installation of a new traffic signal at one or both intersections. The driveways have existing security stations and gates, and all vehicles would check in/out when arriving or leaving the site. This would regulate traffic flow and maximize safety for workers, truck drivers, and bicyclists in the area. This alternative would not create conditions at either driveway entrance/exit or within the Proposed Project area that would impact safety or warrant installation of a new signal. Therefore, safety impacts would be less than significant.

Impact TR-5: Reduce Marine Vessel Safety.

The Full Removal of Offshore Conduits Alternative could reduce the existing level of safety for navigating marine vessels **(Less than Significant)**.

Impact Discussion. Like the Proposed Project, offshore structures would be removed using divers, barges, and tug boats. Debris would be marked with temporary buoys and loaded onto material barges using a high-capacity crane for transport to the POLB. This alternative would also require construction of two temporary trestles, providing approximately 3,400 linear feet of access for each unit removal. In addition, a large volume of material would need to be imported to backfill open trenches. Potential options to backfill the open trenches include: (1) using offshore borrow areas near Oceanside if available, (2) creating an offshore pit, or (3) borrowing from a wider footprint next to the conduit to fill the trench so that a more shallow and acceptable depression footprint is left.

The offshore contractor would need to implement precautions to reduce the risk of other vessels entering the construction area or otherwise being affected by offshore activities. One method is to apply for approval to use private aids to navigation (see Title 33, CFR, Part 66 [33 CFR 66]). Private aids to navigation allow entities, such as dredging contractors, to mark privately owned marine obstructions or similar hazards. As specified in the USCG permit, the owner must install and maintain private aids to navigation (APM-22). Through the permitting process, the U.S. Coast Guard (USCG) would evaluate the navigational safety of any buoys or other markers used for this alternative and appropriate methods to install and maintain the markers would be developed (USCG 2016).

With implementation of APM-9, APM-15, and APM-22, potential safety impacts associated with marine vessels and offshore work would be avoided or minimized. Additionally, APM-18 would require maritime notices for vessels and diving restrictions in the offshore area to further reduce impacts. Impacts associated with marine vessel safety would be less than significant.

Cumulative Impacts

None of the reasonably foreseeable projects in the vicinity of SONGS would induce substantive long-term population growth (e.g., they would not involve new, large residential, or mixed-use developments). Therefore, those projects would not result in a significant increase in the amount of traffic using study area intersections. The traffic generated by this alternative, although lasting several years, would be temporary in nature and would cease with the completion of the decommissioning activities associated with the Proposed Project, which means this alternative would not make a lasting contribution to cumulative impacts associated with traffic and transportation. This alternative would not result in significant adverse traffic or transportation impacts, nor would it contribute to significant or adverse long-term cumulative traffic conditions.

5.4.3 Partial Removal of Offshore Conduits

5.4.3.1 Description

This alternative was ~~proposed~~ identified by SCE in its application to the CSLC (Conduit Alternatives #2 and #3) and includes full removal of the SONGS Unit 2 and Unit 3 offshore intake and discharge conduits from the seawall to approximately 300 feet offshore, leaving the remaining portions of the conduit and fish return conduit in place. This alternative would meet the Proposed Project objectives and may fulfill the CSLC lease requirements. There are no identified feasibility issues with this alternative.

Onshore activities to support offshore work would include construction of a temporary trestle extending from the beach to approximately 300 feet offshore to an approximate water depth of 10 feet, allowing for equipment to be staged in an otherwise inaccessible area. Construction of the temporary trestle would involve driving round steel pilings into the seabed for support. Pile sizes have yet to be determined, but it is anticipated that piles between 24 inches and 36 inches in diameter would be used. Installation of the piles into the seabed would involve the use of either an impact hammer, vibratory hammer, or a combination of these hammers. After the trestle is constructed, a crane would be assembled and work from the top of the trestle to approximately 300 feet offshore in order to unearth and remove the conduit. A clamshell bucket or other current technology would be used by the crane to excavate the conduits and side-cast the excavated sediment. The exposed conduit sections would then be rigged and lifted by the crane onto the trestle. Each conduit segment within 300 feet offshore would be carried along the trestle to the beach to be transported by truck or rail to an approved disposal facility. Side-cast

sediment and other agency-approved materials (e.g., rock, fill, or other material) would be used to backfill the excavated areas to return the seafloor to its original profile. As with the Full Removal of Offshore Conduits Alternative, potential options for backfilling the open trenches could include using offshore borrow areas near Oceanside, creating an offshore pit, or borrowing from a wider footprint adjacent to the conduit in order to fill the trench so that a more shallow and acceptable depression footprint is left (SCE 2017).

As with the Proposed Project, all vertical structures (POIS, AOIS, and MAPS) associated with the intake conduits would be removed. As a variation from the Proposed Project, this alternative includes removal of all diffuser ports on the discharge conduits (126 total, 63 per discharge conduit [the Proposed Project removes 12 total, 6 per discharge conduit, and the remainder would be abandoned in place]). The openings created by removal of the vertical structures would be covered with mammal exclusion barriers to preclude entry into the abandoned conduits and allow for natural migration of sand and sediment into the conduits over time.

Per SCE's *SONGS Decommissioning Project (Units 2 and 3 Offshore Conduits) Engineering Study of Conduit Disposition Alternatives* (2017), the removal of the vertical structures (all POIS, AOIS, MAPS and diffuser ports) would require side casting adjacent to each vertical conduit structure to safely enable structure removal and installation of the mammal exclusion barriers. For the vertical structures with a stone blanket, side casting would be primarily limited to removal of the estimated 2 feet of accumulated sediment present on top of the stone blankets and the approximate top 2 feet of the stone blanket immediately surrounding the vertical structure.

At the MAPS locations without stone blankets, dredging would extend to an estimated depth of 6 feet, which includes removal of 4 feet of cover material over the conduits and about 2 feet of accumulated sediment. Each excavation would have approximate 2:1 side slopes to reduce sloughing of excavation walls during dredging activities. At the buoy anchor locations, the estimated 2 feet of accumulated sediment would be removed to expose and allow cutting of the anchor chains and removal of the anchor blocks (sinkers). If side casting is not possible due to regulatory agency requirements, a "Dredging Plan" would be developed by the selected contractor. Dredging methods would be performed consistent with industry standard practices and approved methods. To minimize turbidity, hydraulic pumping or similar technology is proposed, similar to the SONGS Unit 1 conduit dispositioning-related dredging. A pump with a discharge hose and intake hose would be tethered with a cable and lowered into position from a dive boat. A diver would hold the hoses in position as needed. It is anticipated that dredged materials would be pumped into the intake/discharge conduits during the dispositioning activities. If not determined feasible by the agencies, clamshell excavation could be employed as an alternative approach. If this method is not feasible, the dredged material would be side cast within the approved CSLC lease area boundaries. If necessary, rocks would be relocated and would be side cast within the CSLC lease area boundaries. Potential options for

backfilling the open trenches could include: (1) using offshore borrow areas near Oceanside to the extent they are available, (2) creating an offshore pit or, (3) borrowing from a wider footprint adjacent to the conduit in order to fill the trench so that a more shallow and acceptable depression footprint is left.

Options available to cut concrete underwater include high-pressure water, lance-burning equipment, mechanical hoe ram, and drilling with installation of expansive grouts. The marine contractor may select the most effective means and methods to cut the AOISs, POISs, MAPS and diffuser ports structure (Figure 2-4 and Figure 2-6). For POISs (Figure 2-3), there may be up to six major cuts prior to the velocity cap being removed. Six column cuts may be required at the support columns. As the cut is developed, divers would monitor the cutting progress and may insert wedges into each groove to keep the cuts open. When the cut is completed, the barge crane with a cable sling rigging assembly would lift the segment and set it on the material barge, which is moored alongside the crane barge, for temporary storage. The velocity cap is the first component to be cut. After the velocity cap is removed as a whole or in sections, the segments below the cap would be cut down to and including the segment just above the top of the conduit, removed, and set onto the material barge deck. The concrete surface would then be prepared for the installation of the new steel exclusion grating. Excavation, if needed, may be performed by a long reach excavator and the material from the excavation side cast placed approximately 15 to 20 feet away from the structure, and spread over the ocean bottom. After the velocity cap is removed, an alternative way to remove the structure segments may be to expose the corner and interior column reinforcing cages through each ring interface and chisel-cut each column (i.e., air tool and torch). Each ring may then be lifted clear by the derrick. Finally, a prefabricated mammal exclusion barrier, made of either stainless steel, another steel alloy, or fiberglass reinforced plastic (FRP) would be set onto the top rim of the structure that remains to allow sand migration into the hole. The mammal exclusion barrier would be anchored to the remaining structure or would be designed with sufficient weight to prevent disturbance by divers or wave forces above

Removed vertical structures would be placed on a barge and transported to the POLB or other appropriate facility for recycling and disposal. All other aspects of this alternative would be identical to the Proposed Project. Onshore activities would be the same as described for the Full Removal of Offshore Conduits Alternative (see Section 5.4.2).

5.4.3.2 Environmental Impact Analysis

The impacts of the Partial Removal of Offshore Conduits Alternative in comparison to the Proposed Project are presented in Table 5-6 below.

Table 5-6. Summary: Partial Removal of Offshore Conduits Alternative

HAZARDOUS AND RADIOLOGICAL MATERIALS
• Dredging activities could bring material with detectable amounts of radiation to the surface, which could result in a greater impact associated with radioactive material than under the Proposed Project (Impact HAZ-1 and HAZ-2). APM-1, APM-4, APM-12, APM-13, and APM-14 would be implemented but would not reduce potential impacts to a less-than-significant level. Although Impacts HAZ-1 through HAZ-3 would comply with NRC standards, due to federal preemption, CSLC lacks authority over these plans and procedures. Therefore, there are no feasible mitigation measures that would reduce potential significant effects associated with radiological releases, and the impacts would remain significant and unavoidable. • Differences between this alternative and the Proposed Project occur on the seafloor where no additional non-radiological hazardous materials occur. The volume of non-radiological hazardous waste generated during decommissioning (i.e., hazardous building materials, contaminated soil) would be identical to the Proposed Project. Therefore, the risk to the public from the use and disposal of non-radiological hazardous wastes (Impact HAZ-4) would be less than significant with APM-2 and APM-1, as well as MM HAZ-4. • Onshore impacts related to risk of fire, explosion, or hazardous material release (Impact HAZ-5) would be the same as the Proposed Project and would be less than significant with implementation of APM-1, APM-12, APM-13, APM-14, and MM HAZ-5. The extended offshore work would contribute to a slightly greater risk of hazardous fluid leaks into marine waters, which is covered under Impact WQ-3. • Given that the proposed removal of below-ground structures would not change under this alternative, the risk of exposing workers to hazardous materials in contaminated soil or groundwater (Impact HAZ-6) would be the same as the Proposed Project. With implementation of APM-12 and MM HAZ-6, this impact would be reduced to less than significant. • As with the Proposed Project, with implementation of APMs and mitigation measures, this alternative would not significantly contribute to adverse cumulative impacts.
AESTHETICS
• Impacts would not substantially differ from the Proposed Project. Improvements in visual quality due to removal of the onshore SONGS facilities and the site restoration activities would not change. Removal of the offshore intake and discharge conduits from the seawall to approximately 300 feet offshore with use of a trestle would result in short-term impacts that would not constitute a significant change in the visual character of the site. Similar to the Proposed Project, Impacts AES-1 and AES-3 would remain beneficial, and Impacts AES-2 and AES-4 would be less than significant. • As with the Proposed Project, this alternative would not significantly contribute to adverse cumulative impacts.
AIR QUALITY
• The criteria air pollutant emissions from this alternative would be somewhat higher than those from the Proposed Project due to increased offshore work and additional truck (or rail) trips for exporting conduit and potentially importing backfill material. Like the Proposed Project, the unmitigated emissions would be significant, and APM-3 and MMs AQ-3a and AQ-3b would continue to be required to reduce the NO_X emissions impacts (Impact AQ-3). NO_X emissions within the SCAQMD and MDAQMD jurisdictions would remain significant and unavoidable. The increase in activity offshore of the SONGS site may also cause the San Diego County NO_X emissions to increase to a significant and unavoidable level.

Table 5-6. Summary: Partial Removal of Offshore Conduits Alternative

• This alternative, like the Proposed Project, would have less-than-significant impacts related to air quality/local plan conformance (Impact AQ-1), exceedances of air quality standards (Impact AQ-2), and sensitive receptors (Impact AQ-4) • This alternative would have the same type of odor impacts (Impact AQ-5) as the Proposed Project, including the ocean bottom waste decomposition, and decomposition of plant and animal life on the removed vertical structures that would occur for a longer duration than for the Proposed Project. However, similar to the Proposed Project, these odors would be less than significant as these wastes would be located offshore on a barge, miles from the nearest residential receptors, for a limited time before being shipped to the POLB/POLA, which are also areas not near residential receptors.
BIOLOGICAL RESOURCES
• Impacts to terrestrial biological resources would not differ from the Proposed Project as onshore decommissioning activities would continue in the same manner as the Proposed Project. Onshore decommissioning activities could potentially affect sensitive habitats in the area (Impact BIO-1) or terrestrial special-status species (Impact BIO-2). These impacts could be reduced to a less-than-significant level with the APMs and mitigation measures recommended for the Proposed Project. • Impacts on marine species and habitat from removal of the vertical structures and conduit differ only in terms of their magnitude compared with the Proposed Project. There would be an increase in the magnitude of effects due to the increased activity associated with additional infrastructure removal, although this increase is relatively minor and short term in nature, lasting only as long as the disposition activities. Following removal of infrastructure, disturbed seabed recovery could be expected to occur naturally. The removal of the conduits out to 300 feet would result in significant impacts to critical habitat, such as surfgrass (Impact BIO-10). These impacts are significantly greater than with the Proposed Project. Increased noise levels from offshore activities, such as constructing the trestle would increase the potential to harass marine life (Impact BIO-11). Additional mitigation measures (ALT MM BIO-11a through 11d) would reduce this impact to a less-than-significant level. • As with the Proposed Project, this alternative would not significantly contribute to adverse cumulative impacts to terrestrial or marine biological resources.
CULTURAL AND PALEONTOLOGICAL RESOURCES
• Onshore impacts to cultural resources would be the same as the Proposed Project. Implementation of APM-10 and MMs CR/TCR-2a and CR/TCR-2b would reduce potential impacts to a less-than-significant level. • Activities along the shore could disturb or destroy previously unrecorded cultural resources. Implementation of APM-10 and MMs CR/TCR-2a and CR/TCR-2b would reduce potential impacts to a less-than-significant level. • Activities in the offshore environment would disturb ocean floor sediments during the removal of conduits. However, the area of disturbance would be limited to areas previously disturbed by the installation of the conduits and, with implementation of MM CR/TCR-2c, no new impacts to offshore cultural resources would occur. Impacts would be less than significant. • Onshore impacts to paleontological resources would be the same as the Proposed Project. Additional work proposed along the onshore area of the seawall to aid in removal of the offshore conduits would not cause additional adverse impacts to paleontological resources. Implementation of MMs CR-4a and CR-4b would reduce potential impacts to a less-than-significant level.

Table 5-6. Summary: Partial Removal of Offshore Conduits Alternative

• Activities in the offshore environment to remove conduits along the ocean floor would not result in disturbance to paleontological resources since the area of disturbance is limited to the area previously disturbed during conduit installation. Therefore, no new impacts to paleontological resources would occur. Implementation of MMs CR-4a and CR-4b would reduce potential impacts to a less-than-significant level. • Although unlikely, unidentified human remains could be discovered during decommissioning. APM-11 would ensure that impacts to human remains would be further minimized. • As with the Proposed Project, implementation of MMs CR-4a and CR-4b would reduce potential cumulative impacts to paleontological resources to a less-than-significant level, and may also contribute to the expansion of knowledge about sensitive paleontological resources within San Diego County and greater Southern California region.
CULTURAL RESOURCES – TRIBAL
• Onshore impacts to tribal cultural resources would be the same as the Proposed Project. Implementation of APM-10, APM-11, and MMs CR/TCR-2a and CR/TCR-2b would reduce potential impacts to a less-than-significant level. • Activities along the shore could disturb or destroy previously unrecorded Tribal cultural resources. Implementation of APM-10, APM-11, and MMs CR/TCR-2a and CR/TCR-2b would reduce potential impacts to a less-than-significant level. • Activities in the offshore environment, namely the removal of the conduits from the seawall to approximately 300 feet offshore, would not likely result in disturbance to Tribal cultural resources since the area of disturbance is limited to the area previously disturbed during conduit installation, and with implementation of MM CR/TCR-2c, impacts to offshore Tribal cultural resources would be less than significant. • Although unlikely, unidentified human remains could be discovered during decommissioning. APM-11 would ensure that impacts to human remains would be further minimized. • Like the Proposed Project, this alternative would not contribute to cumulative impacts to Tribal cultural resources.
GEOLOGY, SOILS, AND COASTAL PROCESSES
• Activities for this alternative only differ from the Proposed Project as it relates to conduit removal offshore and, therefore, would not increase potential soil erosion impacts. No impact would occur related to nearshore and offshore slope stability along the flat to gently sloping seafloor. Similar to the Proposed Project, grading and excavation under this alternative would not trigger landslides (Impact GEO/CP-1). Further, this alternative would implement the same BMPs that would be required for the Proposed Project to avoid any significant erosion impacts (Impact GEO/CP-2), such as APM-12. Geology and soils impacts would be the same as the Proposed Project. • Coastal process impacts would not substantially differ from the Proposed Project. Full removal of the Unit 2 and Unit 3 offshore intake and discharge conduits from the seawall to approximately 300 feet offshore and backfilling to the original profile would impair coastal sediment properties less than the Proposed Project. With regard to Impact GEO/CP-3, the Proposed Project included a small, but negligible loss of sediment from the coastal littoral supply, and this alternative would impart an even smaller loss of sediment, since there would be less open conduit to infill from the ambient littoral system. • With regard to Impact GEO/CP-4, this alternative would have the same small, negligible changes to water waves, currents, and circulation as the Proposed Project and would

Table 5-6. Summary: Partial Removal of Offshore Conduits Alternative

remain less than significant. As with the Proposed Project, there would be no impact from tsunami threats (Impact GEO/CP-5). • As with the Proposed Project, this alternative would not significantly contribute to adverse cumulative impacts.
GREENHOUSE GAS EMISSIONS
• The GHG emissions from this alternative would be somewhat higher than those from the Proposed Project due to the additional offshore work required. Like the Proposed Project, the unmitigated emissions are anticipated to be less than significant. • This alternative, like the Proposed Project, would have less-than-significant impacts related to compliance with applicable GHG emissions reduction plans, policies, or regulations (Impact GHG -2).
HYDROLOGY AND WATER QUALITY
• Due to the increased demolition activities in the nearshore region, as well as the need to potentially backfill void areas created by conduit removal, this alternative would increase turbidity and marine debris (Impact WQ-6) more than the Proposed Project. As with the Proposed Project, Impact WQ-6 would be less than significant with implementation of APM-1, APM-15, and APM-16. • Impact WQ-7 would be slightly greater than the Proposed Project, but would still be less than significant with implementation of APM-17. • Because onshore D&D activities would be the same as the Proposed Project, impacts related to polluted runoff (Impact WQ-1) and depletion of groundwater (Impact WQ-3) would be identical to the Proposed Project, resulting in less-than-significant impacts with the inclusion of APM-1, APM-2, APM-12, APM-13, and APM-14. • The potential for encountering contaminated groundwater during onshore decommissioning activities (Impact WQ-2) would be the same as the Proposed Project and impacts can be reduced to a less-than-significant level with implementation of MM HAZ-6. • Because onshore decommissioning activities would be identical to the Proposed Project, the potential for erosion or siltation (Impact WQ-4) would be the same as the Proposed Project, resulting in less-than-significant impacts with implementation of APM-12 and MM WQ-4. • Onshore alterations to drainage patterns (Impact WQ-5) would be the same as the Proposed Project, with the potential for drainage alterations to adversely affect the shoreline public access walkway. This impact can be mitigated to a less-than-significant level with implementation of MM WQ-5. • As with the Proposed Project, with implementation of APMs and mitigation measures, this alternative would not significantly contribute to adverse cumulative impacts.
LAND USE AND PLANNING
• Like the Proposed Project, implementation of this alternative would not conflict with applicable land use plans, policies, and regulations of agencies with jurisdiction (Impact LU-1). Therefore, no impacts would occur. • Activities offshore and along the shore would be extended or intensified, which would prolong or increase temporary disturbances to onshore and offshore uses, including sensitive uses (Impact LU-2). With implementation of MMs LU-2a through LU-2c, this impact and contributions to cumulative impacts would be less than significant.
NOISE
• Onshore noise and vibration levels would be very similar or identical to the Proposed Project. Average and maximum sound levels from worst-case, temporary D&D activities would not exceed San Diego County Noise Ordinance or General Plan Noise Element limits (Impact NOI-1), nor would they significantly increase ambient noise levels at the nearest

Table 5-6. Summary: Partial Removal of Offshore Conduits Alternative

sensitive receptors (Impact NOI-2). Furthermore, temporary vibration would attenuate to below perceptible ranges at the nearest sensitive receptors (Impact NOI-3). Temporary onshore noise and vibration impacts would be less than significant. • Installation of the trestle and its piles and removal of the conduit offshore would create additional noise that could affect divers, swimmers, and surfers (Impact NOI-4). Temporary marine noise levels would be reduced to a less-than-significant level by implementing ALT MM NOI-4, ALT MM BIO-11b, and APM-18, and creating an exclusion zone (Figure 5-1). • As with the Proposed Project, this alternative would not significantly contribute to adverse cumulative impacts.
RECREATION AND PUBLIC ACCESS
• Offshore and shoreline activities would be extended compared to the Proposed Project. Prolonging the intermittent restrictions or prohibitions on public access to shoreline and water-dependent recreational uses would result in greater impacts than the Proposed Project. With implementation of MMs REC-1a and REC-1b, Impact REC-1 would be less than significant. • Extending the duration of offshore and shoreline activities would lengthen the period during which additional personnel may use parks and campgrounds. Most decommissioning personnel would commute from San Diego and Orange Counties, which would reduce this potential impact. Additionally, both San Onofre and San Clemente State Beaches have limitations on the number of days that campgrounds can be used by an individual, as well as how frequently campgrounds can be re-accessed. Therefore, Impact REC-2 would be less than significant. • Onshore activities would be identical to the Proposed Project, including construction staging and demolition near existing recreation areas. Implementation of MMs REC-1a and REC-1b would ensure that recreationists are kept clear of hazardous areas, thereby reducing Impact REC-3 to less than significant. • As with the Proposed Project, this alternative would not significantly contribute to adverse cumulative impacts.
TRANSPORTATION AND TRAFFIC
• Additional trucking activities would occur to export removed conduit and potentially import material to backfill the open trenches created by removing the conduit. Therefore, onshore transportation and traffic impacts would be greater than the Proposed Project. However, given the magnitude of offsite truck trips generated from onshore activities, the number of trips associated with removal of 300 feet of conduit and potential backfill material would not have a significant adverse impact on affected intersections (Impact TR-1) with the inclusion of APM-19, APM-20, and MM REC-1b. Because onshore activities would not differ substantially from the Proposed Project, impacts on pedestrian and bicycle safety (Impact TR-2) would be the same as the Proposed Project and can be reduced to a less-than-significant level with implementation of APM-21 and MM REC-1a. Effects on rail operations would be similar to or the same as the Proposed Project, depending on whether conduit segments are transported by rail, and less than significant (Impact TR-3). Safety impacts related to site access (Impact TR-4) would also be less than significant. • Additional activity associated with the removal of components of the offshore conduits would occur, but would not substantially change impacts related to marine vessel navigation and safety (Impact TR-5). Like the Proposed Project, this impact would be reduced to a less-than-significant level with implementation of APM-9, APM-15, APM-18, and APM-22. • As with the Proposed Project, this alternative would not significantly contribute to adverse cumulative impacts.

Table 5-6. Summary: Partial Removal of Offshore Conduits Alternative

UTILITIES AND PUBLIC SERVICE SYSTEMS
• Like the Proposed Project, implementation of this alternative would not result in the need for new or physically altered facilities to maintain the currently level of fire protection or emergency response services. Full removal of the Unit 2 and Unit 3 offshore intake and discharge conduits from the seawall to approximately 300 feet offshore would not constitute a significant change in the Proposed Project's use of or need for utilities or service systems. Impact USS-1 through USS-4 would remain less than significant and would not conflict with applicable solid waste statutes and regulations (Impact USS-5). • As with the Proposed Project, this alternative would not significantly contribute to adverse cumulative impacts.

5.4.4 Full (or Partial) Removal of Onshore Subsurface Structures

5.4.4.1 Description

Under this alternative the DoN as landowner may require more onshore structure removal than under the Proposed Project, which leaves subsurface structures in place 3 feet below the existing local grade (27 feet mean lower low water [MLLW] in the protected area [PA] – area encompassed by physical barriers to which access is controlled) and possibly lower for certain contaminated structures (depth not to exceed 9 feet MLLW or approximately 21 feet below local grade in the PA) per NRC regulations. While the extent of additional subsurface structure removals in not known, it could range from greater than 3 feet (partial) to full removal. The greatest impacts would be associated with full removal of subsurface structures and is therefore analyzed herein. The timeline of these removals is not known. For example, the remaining Unit 1 infrastructure located underneath the Approved ISFSI would not be removed until after all SNF has been removed and the Approved ISFSI can be demolished. All other aspects of this alternative, including offshore work, would be identical to the Proposed Project.

Table 5-7 provides estimates of potential import and export types and quantities for full removal of all remaining components at the SONGS site beyond the Proposed Project.

This alternative is feasible and consistent with the Proposed Project objectives. Under this alternative, the site would be returned to a natural condition. Any contamination would be removed, and the potential for coastal erosion processes to uncover subsurface structures in the future would be reduced. While the DoN has not yet decided on onshore restoration requirements, this alternative is considered to be a reasonable scenario for what may be required and is not overly speculative.

Table 5-7. Estimated Waste Volumes for Full Removal of Onshore Subsurface Structures

Export Waste Types	Project Description Volume (cubic feet)	Units 2 & 3 Remaining Removal Volume[1] (cubic feet)	Unit 1 Remaining Structure Removal Volume[2] (cubic feet)	Export Waste Totals (cubic feet)
Non-Radioactive Debris[2]	12,606,135	10,802,031	1,559,914	**24,968,080**
Non-Radioactive Metal	6,159,600	3,282,472	525	**9,442,597**
Non-Radioactive Total	18,765,735	14,084,503	1,560,439	**34,410,677**
Radioactive Class A Debris	5,729,494	8,202	7,125	**5,744,821**
Radioactive Class A Containerized	80,406	0	0	**80,406**
Radioactive Class A Large Component	135,977	0	0	**135,977**
Radioactive Class A Oversize	433,735	0	0	**433,735**
Radioactive Class A Mixed Waste	3,012	0	0	**3,012**
Radioactive Classes B and C Waste	8,242	0	0	**8,242**
Radioactive Totals	6,390,866	0	7,125	**6,397,991**
Totals	25,156,601	14,084,503	1,567,564	**40,808,668**

Source: SCE 2018j – DR #7-9.

Notes:

[1] Does not include offshore conduit.

[2] Includes Approved ISFSI, asphalt, seawall, pedestrian walkway, and railway removal.

5.4.4.2 Environmental Impact Analysis

The impacts of the Full (or Partial) Removal of Onshore Subsurface Structures Alternative in comparison to the Proposed Project are presented in Table 5-8~~7~~ below.

Table 5-~~7~~8. Summary: Full (or Partial) Removal of Onshore Subsurface Structures Alternative

HAZARDOUS AND RADIOLOGICAL MATERIALS
• While this alternative would entail a more comprehensive removal of subsurface structures, no significant change in radiological impacts is anticipated compared to the Proposed Project. The information presented in the Historical Site Assessment and the Site Characterization Report, together with the experience gained from Unit 1 decommissioning, suggest that it is unlikely that significant unknown subsurface contamination would be encountered. Although Impacts HAZ-1 through HAZ-3 would comply with NRC standards, plans, and procedures, due to federal pre-emption, CSLC lacks authority over these plans and procedures. Therefore, there are no feasible mitigation measures that would reduce potential significant effects associated with radiological releases, and the impacts would remain significant and unavoidable. • The volume of non-radiological hazardous waste generated from the removal of the below-grade structures could be greater than the Proposed Project (Impact HAZ-4); however, APM-1, APM-2, and MM HAZ-4 would be implemented to reduce potential impacts from the use or disposal of non-radiological hazardous materials to less than significant. • Public access to SONGS would continue to be restricted, thereby reducing the risk of public exposure to hazardous materials. However, the full or partial removal of onshore subsurface structures would require a longer duration of activities, which would increase the risk of hazardous material spills, leaks from equipment and vehicles, and encountering contaminated soil and groundwater due to deeper and larger excavations (Impact HAZ-5). This impact would be less than significant with adherence to APM-1, APM-12, APM-13, APM-14, and MM HAZ-5. • The increased onshore activity would increase the risk of exposing workers to hazardous materials in contaminated soil or groundwater (Impact HAZ-6). With implementation of APM-12 and MM HAZ-6, this impact would be less than significant. • As with the Proposed Project, with implementation of APMs and mitigation measures, this alternative would not significantly contribute to adverse cumulative impacts.
AESTHETICS
• Impacts would not substantially differ from the Proposed Project. While this alternative would require a more complete removal of subsurface structures, the removal of above-ground structures and site restoration, as proposed, would contribute most to improving the site's visual quality. Similar to the Proposed Project, Impacts AES-1 and AES-3 would remain beneficial, and Impacts AES-2 and AES-4 would be less than significant. • As with the Proposed Project, this alternative would not significantly contribute to adverse cumulative impacts.
AIR QUALITY
• The criteria air pollutant emissions from this alternative would be higher than those from the Proposed Project, perhaps substantially higher, due to the additional onshore work required. Therefore, like the Proposed Project, the unmitigated emissions would be significant and APM-3 and MMs AQ-3a and AQ-3b would continue to be required to reduce the NO_X emissions impacts (Impact AQ-3). Additional measures may be needed to address fugitive dust emissions depending on the amount and type of additional work required. NO_X emission impacts within the SCAQMD jurisdiction would remain significant and unavoidable, and the increase in work activity at the SONGS site may also cause the San Diego County NO_X emissions impacts to increase to a significant and unavoidable level.

Table 5-~~7~~8. Summary: Full (or Partial) Removal of Onshore Subsurface Structures Alternative

• This alternative, like the Proposed Project, would have less-than-significant impacts related to air quality/local plan conformance (Impact AQ-1), exceedances of air quality standards (Impact AQ-2), and sensitive receptors (Impact AQ-4). • This alternative would have the same type of odor impacts (Impact AQ-5) as the Proposed Project, including odors from the decomposition of plant and animal life on the removed conduit and vertical structures that would occur for a longer duration than for the Proposed Project. However, similar to the Proposed Project, these odors would be less than significant as these wastes would be located offshore on a barge, miles from the nearest residential receptors, for a limited time before being shipped to the POLB/POLA, which are also areas not near residential receptors. • As with the Proposed Project, this alternative would significantly contribute to adverse cumulative impacts in the South Coast Air Basin. Measures to reduce NO_X impacts include APM-3, and MMs AQ-3a and AQ-3b; however, cumulative impacts would be significant and unavoidable.
BIOLOGICAL RESOURCES
• Impacts to terrestrial biological resources would be similar to the Proposed Project, except that disturbance-related impacts would occur over a longer period of time due to the additional excavation, demolition, and disposal activities associated with removal of subsurface structures onshore. The onshore decommissioning activities could potentially affect sensitive habitats in the area (Impact BIO-1), terrestrial special status species (Impact BIO-2), disturb non-listed roosting bats or roosting sites (Impact BIO-3), degrade onshore waters of the U.S./State (Impact BIO-4), and conflict with adopted conservation plans (Impact BIO-6). All of these impacts could be reduced to a less-than-significant level with the same APMs and mitigation measures recommended for the Proposed Project. • Impacts on marine species and habitat would be identical to the Proposed Project, as all changes associated with this alternative would occur onshore. Shore-based decommissioning activities may result in polluted runoff that could adversely affect marine habitat and species (Impact BIO-7), and marine vessels used for offshore ~~conduit dispositioning~~ CSLC Lease Offshore Activities present the risk of an oil or fuel spill that could harm marine species (Impact BIO-8), Like the Proposed Project, these impacts would not be significant. • Significant impacts from offshore decommissioning activities would include the potential release of H_2S gas from the intake and discharge conduits causing mortality of marine organisms (Impact BIO-9), damage to seabed communities from conduit and buoy anchor removal activities and vessel anchoring (Impact BIO-10), disturbance of marine mammals and turtles from decommissioning noise (Impact BIO-11), and spread of invasive and non-native marine species (Impact BIO-12). These impacts would be reduced to a less-than-significant level with implementation of the same APMs and mitigation measures recommended for the Proposed Project. • No impacts related to interference with established native resident or migratory wildlife corridors would occur, same as the Proposed project (Impact BIO-5). • As with the Proposed Project, this alternative would not significantly contribute to adverse cumulative impacts to terrestrial or marine biological resources.
CULTURAL AND PALEONTOLOGICAL RESOURCES
• Onshore impacts to cultural resources would be the same as the Proposed Project. Implementation of APM-10, APM-11, and MMs CR/TCR-2a and CR/TCR-2b would reduce potential impacts to a less-than-significant level.

Table 5-~~7~~8. Summary: Full (or Partial) Removal of Onshore Subsurface Structures Alternative

• Activities in the offshore environment would be identical to the Proposed Project, resulting in disturbance of seafloor sediments during conduit removal. The area of disturbance would be limited to areas previously disturbed by the installation of the conduit and with implementation of MM CR/TCR-2c, impacts to cultural resources would be less than significant. • Like the Proposed Project, with implementation of APM-10 and MMs CR/TCR-2a, CR/TCR-2b, CR/TCR-2c, CR-4a, and CR-4b, this alternative would not contribute to cumulative impacts to cultural resources. • Onshore impacts to paleontological resources would be the same as the Proposed Project. Implementation of MMs CR-4a and CR-4b would reduce potential impacts to a less-than-significant level. • As with the Proposed Project, implementation of MMs CR-4a and CR-4b would reduce contributions to potential cumulative impacts to paleontological resources to a less-than-significant level and may also contribute to the expansion of knowledge about sensitive paleontological resources within San Diego County and greater Southern California. region.
CULTURAL RESOURCES – TRIBAL
• Onshore impacts to Tribal cultural resources would be the same as the Proposed Project. Implementation of APM-10, APM-11, and MMs CR/TCR-2a and CR/TCR-2b would reduce potential impacts to a less-than-significant level. • As with the Proposed Project, with implementation of APMs and mitigation measures, this alternative would not contribute to cumulative impacts on Tribal cultural resources.
GEOLOGY, SOILS, AND COASTAL PROCESSES
• Impacts would be very similar to the Proposed Project. However, completely removing underground onshore structures would create larger and deeper excavations with potentially unstable sidewalls (Impact GEO/CP-1). All grading and excavation within the SONGS site would be conducted per accepted engineering standards and in compliance with local and DoN grading requirements and, therefore, impacts would remain less than significant. • Full removal of onshore structures would introduce additional soil disturbance, increasing the potential for soil erosion (Impact GEO/CP-2). Adherence to APM-12 (SWPPP) and its associated BMPs for erosion and runoff control would avoid significant impacts. • Coastal process impacts would not differ from the Proposed Project as offshore conduit removal activities would be the same as the Proposed Project. There would be a small, but negligible loss of sediment from the coastal littoral supply (Impact GEO/CP-3) that would not be significant. Onshore sand would not return to the littoral supply until the seawall is removed, which may or may not occur as part of Future Activities. • With regard to Impact GEO/CP-4, this alternative would have the same small, negligible changes to water waves, currents, and circulation as the Proposed Project and tsunami threats (Impact GEO/CP-5) would remain no impact. • As with the Proposed Project, this alternative would not significantly contribute to adverse cumulative impacts.
GREENHOUSE GAS EMISSIONS
• The GHG emissions from this alternative would be higher than those from the Proposed Project due to the additional onshore work required. However, this increase would not be substantial enough to exceed the emissions significance threshold. Therefore, like the Proposed Project, the unmitigated emissions would be less than significant. • This alternative, like the Proposed Project, would have less-than-significant impacts related to compliance with GHG emissions reduction plans, policies, or regulations (Impact GHG-2).

Table 5-~~7~~8. Summary: Full (or Partial) Removal of Onshore Subsurface Structures Alternative

HYDROLOGY AND WATER QUALITY
• The offshore aspects of this alternative would be identical to the Proposed Project, including increased turbidity, marine debris, and potential offshore chemical spills (Impacts WQ-6 and WQ-7); and effects on water and sediment quality from changes in water circulation (Impact WQ-8). Like the Proposed Project, these impacts would be less than significant with implementation of APM-1, 15, 16, and 17. • With increased land-side demolition activities, the risk for chemical spills from land would be greater (Impact WQ-1), but significant impacts would be avoided through compliance with APM-1, APM-2, APM-12, APM-13, and APM-14. • Potential impacts related to groundwater depletion (Impact WQ-3) would be identical to the Proposed Project, resulting in less-than-significant impacts. Deeper excavation, however, would increase the potential to encounter groundwater and the likelihood for encountering contaminated groundwater (Impact WQ-2) would be greater than the Proposed Project. Implementation of MM HAZ-6 would reduce impacts to less than significant. • The increase in land-side demolition activities would result in an increased risk for degrading water quality due to erosion and siltation (Impact WQ-4). As with the Proposed Project, significant impacts would be avoided with implementation of APM-12 and MM WQ-4. • Due to greater excavation and ground disturbance, on-site drainage patterns (Impact WQ-5) would be altered more substantially than the Proposed Project. However, site restoration would restore drainage patterns such that they would be similar to the Proposed Project. This could still result in an adverse impact on the shoreline public access walkway, which would be mitigated to a less-than-significant level with implementation of MM WQ-5. • As with the Proposed Project, with implementation of APMs and mitigation measures, this alternative would not significantly contribute to adverse cumulative impacts.
LAND USE AND PLANNING
• Like the Proposed Project, implementation of this alternative does not conflict with applicable land use plans, policies, and regulations of agencies with jurisdiction (Impact LU-1). Therefore, no impacts would occur. • The duration of onshore activities would be longer, which could extend the duration of temporary disturbances to onshore and offshore uses, including sensitive uses (Impact LU-2). With implementation of MMs LU-2a through LU-2c, this impact and contributions to cumulative impacts would be less than significant.
NOISE
• Onshore noise and vibration levels would be similar to the Proposed Project, but would involve more daily use of certain heavy equipment to remove concrete foundations and other subsurface structures. However, even with this additional use factor, average and maximum sound levels from worst-case temporary D&D activities would not significantly differ from those presented for the Proposed Project (70 dBA and 71 dBA at the northern edge and northwestern edge of the seawall walkway, 63 dBA to 65 dBA at the southern end of the State Surf Beach, and 53 dBA and 54 dBA at the closest residential uses on Camp Pendleton). These noise levels would not exceed San Diego County Noise Ordinance standards or General Plan Noise Element limits (Impact NOI-1), nor would they significantly increase ambient noise levels at the nearest sensitive receptors (Impact NOI-2). • While the duration of temporary vibration may increase, most additional work would be subterranean and all temporary vibration would attenuate to below perceptible ranges at the nearest sensitive receptors (Impact NOI-3). Temporary noise and vibration impacts would be less than significant.

Table 5-~~7~~8. Summary: Full (or Partial) Removal of Onshore Subsurface Structures Alternative

• Temporary marine noise levels (Impact NOI-4) related to offshore ~~conduit disposition~~ CSLC Lease Offshore Activities would be identical to the Proposed Project. • As with the Proposed Project, this alternative would not significantly contribute to adverse cumulative impacts.
RECREATION AND PUBLIC ACCESS
• Activities would be longer in duration, which could potentially increase the duration of intermittent restrictions or prohibitions on public access to shoreline and water-dependent recreational facilities. With implementation of MMs REC-1a and REC-1b, Impact REC-1 and contributions to cumulative impacts would be less than significant. • The longer duration of activities would lengthen the period during which personnel may use parks and campgrounds. Most decommissioning personnel would commute from San Diego and Orange Counties, which would reduce this potential impact. San Onofre and San Clemente State Beaches also limit the number of days an individual can use and re-access a campground. Therefore, Impact REC-2 would be less than significant. • Onshore activities would include construction staging and demolition near existing recreation areas, which is similar to the Proposed Project. Implementation of APM-18 and MM REC-1a would ensure that recreationists are kept clear of hazardous areas, thereby reducing Impact REC-3 to less than significant. • As with the Proposed Project, this alternative would not significantly contribute to adverse cumulative impacts.
TRANSPORTATION AND TRAFFIC
• Onshore decommissioning activities would be more extensive because subsurface structures would be completely removed. Therefore, onshore traffic impacts would continue for a longer period of time as additional truck trips would be required to haul waste away from the site. While additional truck trips would be generated by this alternative, these additional trips would not have a significant adverse impact on affected intersections (Impact TR-1) with implementation of APM-19, APM-20, and MM REC-1b. • Impacts on pedestrian and bicycle safety (Impact TR-2) would be the same as the Proposed Project. This impact would be reduced to a less-than-significant level with implementation of APM-21 and MM REC-1a. • Effects on rail operations would be the same as the Proposed Project and less than significant (Impact TR-3). • Safety impacts related to site access would continue for a longer period of time (Impact TR-4), but would be less than significant. • Offshore activity related to the removal of the offshore conduits would be the same as the Proposed Project. Therefore, marine vessel navigation and safety impacts (Impact TR-5) would be the same as the Proposed Project and can be reduced to a less-than-significant level with implementation of APM-9, APM-15, APM-18, and APM-22. • As with the Proposed Project, this alternative would not significantly contribute to adverse cumulative impacts.
UTILITIES AND PUBLIC SERVICE SYSTEMS
• Like the Proposed Project, this alternative would not require new or altered facilities to maintain current levels of fire protection or emergency response services or need for utilities or service systems. Impacts USS-1 through USS-4 would remain less than significant and would not conflict with applicable solid waste statutes and regulations (Impact USS-5). • As with the Proposed Project, this alternative would not significantly contribute to adverse cumulative impacts.

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6.0 OTHER REQUIRED CEQA SECTIONS AND ENVIRONMENTALLY SUPERIOR ALTERNATIVE

As noted in this Environmental Impact Report (EIR), Southern California Edison Company (SCE), San Diego Gas & Electric Company (SDG&E), and the City of Riverside (collectively, Applicant) applied to the California State Lands Commission (Commission or CSLC) to decommission portions of San Onofre Nuclear Generating Station (SONGS) Units 2 and 3 authorized by CSLC Lease No. PRC 6785.1 (CSLC Lease Facilities). Disposition of the CSLC Lease Facilities, which are: the SONGS Units 2 and 3 offshore intake and discharge conduits; riprap along the shore seaward of the ordinary high-water mark; and offshore environmental monitoring buoys used to collect data for a SONGS-related marine environmental monitoring program, is part of the larger, long-term plan to decommission SONGS pursuant to U.S. Nuclear Regulatory Commission (NRC) and landowner requirements. The SONGS Decommissioning Plan has three components:

- **Approved Independent Spent Fuel Storage Installation, Operation, and Maintenance (Approved ISFSI)** (2015 through 2035)
- **Proposed Project** (2019 through 2028) – the project analyzed in this EIR
- **Future Activities** (estimated to begin in 2035)

The DoN-owned land where Proposed Project decommissioning-related work would occur includes an approximately 84-acre easement for the primary nuclear facilities (DoN Easement); two leased parcels adjacent to the DoN Easement, including parking lots and laydown/storage land comprising approximately 15 acres; and easements for an access road and rail spur (Onshore Site). The 21 acres of tide and submerged lands in the Pacific Ocean, southwest of the Onshore Site (Offshore Site), includes the majority of the CSLC Lease Facilities area.

As lead agency under the California Environmental Quality Act (CEQA), the CSLC prepared this EIR to evaluate the potential significant environmental effects associated with the Proposed Project. Descriptions of the Decommissioning Plan components are provided in Section 2.0, *Project Description*.

The State CEQA Guidelines state in part that an EIR shall:

- Identify and focus on the significant environmental effects of a proposed project (§ 15126.2, subd. (a))
- Describe any significant impacts, including those that can be mitigated but not reduced to a level of insignificance (§ 15126.2, subd. (b))
- Identify significant irreversible environmental changes that would be caused by a proposed project should it be implemented (§ 15126.2, subd. (c))
- Identify effects found not to be significant (§ 15128)

- Identify any growth-inducing impacts of a proposed project such as the ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment (§ 15126.2, subd. (d))

These elements are discussed in Sections 6.1 through 6.4 below.

6.1 SIGNIFICANT ENVIRONMENTAL EFFECTS THAT CANNOT BE AVOIDED

The significant environmental impacts anticipated as a result of the Proposed Project, along with mitigation measures (MMs) to reduce or avoid significant impacts are discussed in Section 4.0, *Environmental Impact Analysis*. State CEQA Guidelines section 15126.2, subdivision (b), requires that an EIR describe any significant impacts that cannot be avoided, even with the implementation of feasible MMs. As shown in Table 6-1, multiple significant unavoidable impacts (i.e., an impact that cannot be reduced to a level of insignificance) of the Proposed Project were identified. These significant and unavoidable impacts are a result of the presence of radiological materials, equipment operations for decommissioning activities, and haul trips for disposal of waste materials.

Table 6-1. Summary of Proposed Project Significant and Unavoidable Impacts

Issue Area (Section)	Impact No. and Impact
Hazardous and Radiological Materials (4.1)	• Impact HAZ-1: Release of Hazardous Radioactive Materials During Decommissioning and Disposal • Impact HAZ-2: Additional Emergency Response Capabilities Required During Decommissioning • Impact HAZ-3: Exposure to Radioactive Groundwater Contamination
Air Quality (4.3)	• Impact AQ-3: Exceed Criteria Pollutant Emissions Thresholds

The Applicant has included Applicant-proposed measures (APMs), which would help to reduce the potential to release hazardous radioactive material, such as APM-1, *Waste Management Program*, APM-4, *Dust Suppression*, APM-12, *Stormwater Pollution Prevention Plan*, APM-13, *Spill Prevention Control and Countermeasure Plan*, and APM-14, *Spill Contingency Plan*. Due to federal pre-emption, CSLC lacks legal authority over these plans and procedures or the authority to require additional measures. Therefore, there are no feasible MMs that would reduce potential significant effects associated with the release of hazardous radioactive materials during decommissioning and disposal. Impacts HAZ-1, HAZ-2, and HAZ-3 would not be reduced to a less-than-significant level. The Applicant has included APM-3, *Vehicle Emission Reductions*, to reduce vehicle emissions. In addition, MMs AQ-3a and AQ-3b are identified to further reduce air quality impacts associated with the Proposed Project; however, even with the use of these APMs and MMs, Impact AQ-3 would not be reduced to a less-than-significant level.

Due to these significant and unavoidable impacts, approval of the lease associated with the Proposed Project would require the Commission to adopt a Statement of Overriding Considerations stating the specific reasons to support its action, in compliance with State CEQA Guidelines section 15093.

6.2 SIGNIFICANT IRREVERSIBLE CHANGES CAUSED BY THE PROJECT IF IMPLEMENTED

Significant irreversible environmental changes that would be involved with a proposed project may include the following (State CEQA Guidelines, § 15126.2, subd. (c)):

- Uses of non-renewable resources during the initial and continued phases of the project, which would be irreversible because a large commitment of such resources makes removal or non-use thereafter unlikely
- Primary impacts and, particularly, secondary impacts which commit future generations to similar uses
- Irreversible damage, which may result from environmental accidents associated with the project

The purpose of the Proposed Project includes the dismantlement of above-grade onshore subsurface structures, systems, and components (SSCs) and partial removal of onshore subsurface SSCs of a non-operating nuclear power plant, the reduction of radioactivity on the SONGS site in accordance with NRC regulations for unrestricted use of the site after decommissioning, and the disposition of offshore facilities on the CSLC ~~L~~lease premises. Some non-renewable and locally limited resources such as fossil fuels would be consumed; however, in the context of local, regional, and global energy consumption, the proposed use of non-renewable fossil fuels associated with Proposed Project implementation would not be considered a large commitment for the use of such resources and would not contribute to the continued use of and reliance upon such non-renewable resources.

The Proposed Project's primary impacts are short-term effects associated with the dismantling and decontamination of SONGS, including the dispositioning of offshore facilities. By their nature, most of these impacts would not have lasting effects and would cease when decommissioning is completed. As a result, they would not adversely affect future generations. The Proposed Project would provide a beneficial result for future generations in that it would reduce contamination at the SONGS site with the goal to meet NRC regulations for unrestricted use of the site.

Implementation of the Proposed Project would result in various forms of environmental damage to the land and seafloor from dismantling and demolition activities. This damage would occur during implementation of the Proposed Project and may persist for a short time afterwards until the site is fully stabilized and restored. None of this damage is

irreversible. In addition, as described in the discussion of Impact HAZ-1 in Section 4.1.4, decommissioning activities associated with the Proposed Project have the potential to result in radiation exposures that could adversely affect workers and the public. Measures to contain or manage airborne fugitive dust, contaminated soils, and liquid effluents can avoid such exposures, but the possibility of accidental exposure to radiation still exists. The SONGS Radiological Protection Program is based on detailed plans and procedures that are implemented through training and certification programs to ensure that employees are qualified and capable of conducting all operations safely and in compliance with applicable regulations, and that they are trained to respond to emergencies to protect workers and the public. In the event of a radiological release, SCE would remain obligated per NRC regulations to decontaminate the site to a level that allows unrestricted use of the site after decommissioning.

6.3 GROWTH-INDUCING IMPACTS OF THE PROPOSED PROJECT

State CEQA Guidelines section 15126.2, subdivision (d), states that growth-inducing impacts of the project must be discussed in the EIR. In general terms, a project may induce spatial, economic, or population growth in a geographic area if it meets any one of the four criteria identified below:

- Removal of an impediment to growth (e.g., establishment of an essential public service or the provision of new access to an area)
- Economic expansion or growth (e.g., changes in revenue base or employment expansion)
- Establishment of a precedent-setting action (e.g., an innovation, a change in zoning, or general plan amendment approval)
- Development or encroachment in an isolated area or one adjacent to open space (i.e., being different from an “infill” type of project)

The Proposed Project does not involve the construction of any new facilities or infrastructure that would result in the removal of an impediment to growth. Rather, the Proposed Project consists of the removal of a major utility facility. The removal of this facility does not involve the establishment of any new public services nor provide access to any previously inaccessible areas. As a result, the Proposed Project would not remove an impediment to growth nor provide facilities or services to support growth.

The Proposed Project would result in temporary increases in employment in the area as workers are hired to complete the decommissioning. These increases in employment would not be sustained for long periods of time and, therefore, are not expected to induce workers to relocate to the local area on a permanent basis. Employees are expected to be drawn largely from the large existing pool of skilled workers in the Los Angeles and San Diego metropolitan areas. Since SONGS is no longer an operating power facility, the substantial economic activity associated with its former operation, including employment

of workers, is now substantially reduced. Therefore, the economic activity associated with decommissioning is minor and not significant as SONGS' economic importance to the local area and region will decline as decommissioning is completed.

The Proposed Project has no precedent-setting action that would lead to growth. The onshore Proposed Project site will remain under the ownership and authority of the DoN, which will dictate the future disposition and use of the SONGS site. Such uses are expected to be consistent with the mission of Marine Corps Base Camp Pendleton (MCBCP) and would not result in the SONGS site being made available for growth-inducing purposes. At this time, the exact future disposition and use of the SONGS site is not known and, therefore, predictions about specific future uses are speculative.

The SONGS site is surrounded by non-urbanized land uses, including areas of MCBCP used for military training purposes, and adjacent areas used for public recreation. New development is not proposed for the SONGS site as part of the Proposed Project, and adjacent areas are planned to remain in their current uses for the foreseeable future. Therefore, implementation of the Proposed Project would not result in the development of or encroachment into an isolated area or area of open space.

6.4 KNOWN AREAS OF CONTROVERSY AND UNRESOLVED ISSUES

Pursuant to State CEQA Guidelines section 15123, subdivision (b)(2), an EIR shall contain a brief summary identifying areas of controversy known to the Lead Agency including issues raised by agencies and the public. During and after public scoping in late 2016, several agencies and the public identified the following areas of controversy, some of which relate to existing facilities rather than the Proposed Project.

- **The Approved ISFSI ~~expansion~~ and SNF storage (existing facility).** This concern applies to the Approved ISFSI portion of the SONGS Decommissioning Plan. The public has expressed concern about the decommissioning of SONGS due to potential hazards associated with radioactive materials at the facility, particularly the on-site storage of SNF. This is not a new concern as SONGS has been generating high-level radioactive waste (HLW) in the form of SNF throughout the course of the power plant's operation, which ended in January 2012. Construction of the ~~existing ISFSI expansion~~ Holtec facility portion of the Approved ISFSI was completed on January 19, 2018, at SONGS to provide capacity for interim storage of SNF previously generated by Units 2 and 3. This ~~expansion~~ new facility and the plan to store SNF at SONGS until 2035 has generated substantial public controversy. Many have advocated for the SNF to be removed from the site as soon as possible due to potential hazards to the public and the environment that could be caused by a failure of the Approved ISFSI's dry storage casks. Some members of the public have offered specific ideas for alternate locations for off-site storage of SNF, while others have simply emphasized that it needs to be removed as quickly as possible. There have also been concerns specifically about storing

the SNF close to the ocean shoreline where earthquakes, tsunamis, and sea-level rise present possible hazards that could damage the Approved ISFSI. The public has also expressed concerns about safety issues during transport of SNF away from SONGS in the future and whether the public would be exposed to hazards if an accident were to occur during transport. As part of a lawsuit settlement (*Citizens Oversight, Inc., et al. v. the California Coastal Commission, Southern California Edison Company, et al.*, Superior Court for County of San Diego), SCE entered into a Settlement Agreement that requires SCE to use "commercially reasonable efforts" to relocate SONGS SNF to an off-site storage facility. Implementation of the Settlement Agreement could result in the transfer of the SNF to a federally or privately-owned consolidated interim storage (CIS) facility prior to the establishment of a federal repository. Until a viable and reasonable location is identified, it is unknown where the SNF will ultimately be stored and what the associated timeline would be for the off-site relocation of SNF. (See Section 1.2.2.3, *Settlement Agreement*.)

The lack of an off-site repository for long-term storage of SNF remains an unresolved issue that continues to generate a substantial amount of public interest, not only for SONGS but for nuclear power facilities across the nation, whether decommissioned or not. The responsibility for the identification and approval of a suitable off-site repository belongs to the federal government, which has exclusive authority over the management, storage, and disposal of SNF and other HLW. The Nuclear Waste Policy Act, as amended, assigns responsibility to the U.S. Department of Energy to identify and select candidate repository sites for SNF and other HLW, and to characterize and analyze these sites to determine their suitability for the development of a repository. To date, the Federal government has not approved a repository for SNF and other HLW, although options are currently under discussion in Congress. (See Appendix D1: Management, Storage, Transportation, and Disposal of Spent Nuclear Fuel and High-Level Waste at San Onofre Nuclear Generating Station.)

- **Storage casks (existing facility)**. This concern also applies to the Approved ISFSI portion of the SONGS Decommissioning Plan. The vendor, Holtec International, revised a storage cask internal component called the basket shim in 2016. The shims help center the basket, which houses used fuel and fosters the flow of helium to transfer heat from the fuel. As of January 2018, SCE has placed four loaded canisters with the newer basket shim in the concrete storage facility at SONGS. In March 2018, SCE discovered a loose piece of a shim (4 inches by ½ inch) while preparing to load a canister. SCE temporarily paused work transferring the used fuel to the dry storage canisters to evaluate the vendor's fabrication modifications. SCE validated the canisters' integrity for on-site storage safety purposes. SCE asked Holtec and an independent engineering firm to review the original shim basket design to ensure it remains consistent with the NRC

requirements, and it was determined that it does. SCE ~~has~~ therefore resumed fuel transfer work, loading the 30 canisters with the original basket shim design. The remaining canisters with the new design are on hold pending completion of a NRC inspection. ~~until~~ Holtec completed~~s~~ an internal root cause evaluation. NRC issued an inspection report on November 29, 2018, and conducted a Predecisional Enforcement Conference on January 9, 2019; its enforcement determination is pending.

Another incident associated with the loading of canisters occurred in August 2018. As a canister was being lowered into the Approved ISFSI suspended from a Holtec Vertical Cask Transporter (VCT), the canister encountered an interference with the Cavity Enclosure Container divider shell and became bound in place. As a result, the downloader slings of the VCT became slack while the canister was resting only partially inside the Cavity Enclosure Container. Once aware of the situation, the VCT towers were raised to restore tension in the rigging and to raise the canister. The VCT was then adjusted, and the canister was safely lowered into the Cavity Enclosure Container. While there was no effect on the integrity of the canister or release of radioactive materials, this event placed the VCT in a configuration which defeated its ability to perform its safety function, rendering it incapable of mitigating the consequences of an accident with no redundant equipment available and operable to perform the required safety function. This event is currently under investigation by the NRC. (NRC 2018a).[56] NRC conducted a Predecisional Enforcement Conference on January 24, 2019 at which NRC staff stated that the agency anticipates making a determination within 25 days to be communicated to the public. A decision on whether to allow SCE to resume loading of SNF into the Approved ISFSI will be made after completion of the inspection process.

- **Disposition of the Unit 2 and Unit 3 offshore conduits (Proposed Project).** A public concern directly related to the Proposed Project is how best to disposition the Unit 2 and Unit 3 offshore conduits. Options range from abandonment in place to full removal. The Applicant proposes to partially remove the conduits, specifically the partial removal of the vertical intake and discharge structures, including 12 diffuser ports. The CSLC would take action on the dispositioning of offshore conduits as part of its decision on the Proposed Project, as would the CCC in its coastal development permit review of SONGS Decommissioning. As landowner of the onshore SONGS facility, the DoN would also need to determine the acceptable end-state conditions for the onshore connection to the conduits.

Additional concerns were expressed during the scoping period for the EIR and these are presented in Appendix C, *Public Scoping Documents,* specifically the *Index to Scoping*

[56] For additional information, see NRC's webpage at: https://www.nrc.gov/reactors/operating/ops-experience/songs-spec-insp-activities-cask-loading-misalignment.html

Comments. Examples of these concerns include the Proposed Project's potential effects related to the ocean environment, public access to the coast, biological resources, wastewater discharges, local/regional transportation systems, hazardous materials, public services, and air quality. However, none of these additional concerns were expressed in such quantity or detail to be considered particularly controversial.

6.5 COMPARISON OF PROPOSED PROJECT AND ALTERNATIVES AND ENVIRONMENTALLY SUPERIOR ALTERNATIVE

State CEQA Guidelines section 15126.6, subdivision (e)(2), states, in part, that an EIR shall identify an environmentally superior alternative among the other alternatives "if the environmentally superior alternative is the 'No Project' alternative" (emphasis added). Table 6-2 compares the Proposed Project impacts with those of the alternatives. Based on the analysis contained within the EIR, the CSLC has determined that the No Project Alternative would be environmentally superior as it would avoid impacts on the marine environment that are not avoided by the Proposed Project or the other alternatives. Among the other alternatives, the Proposed Project is the Environmentally Superior Alternative because it would have the smallest impact on the marine environment and would have impacts either less than or identical to the other alternatives related to onshore decommissioning activities.

6.5.1 Proposed Project

The following activities would result from approval of the lease associated with the Proposed Project:

- Approval of a new CSLC Lease (existing lease is No. PRC 6785.1) to allow for the disposition (removal or abandonment) of the Lease Facilities as part of the decommissioning process. The new lease would expire in 2035.
- Removal of the following SONGS Units 2 and 3 Offshore Site components:
    - 2 POIS structures – 1 each for Units 2 and 3 intake conduits
    - 2 AOIS structures – 1 each for Units 2 and 3 intake conduits
    - 12 diffuser structures – 6 each for Units 2 and 3 discharge conduits
    - 23 MAPS (intake & discharge) – 12 for Unit 2 and 11 for Unit 3
    - 1 fish return conduit (terminal end rising above the seafloor)
    - 3 environmental monitoring and 2 navigational buoys and their attached water quality instruments and anchors

The intake and discharge conduits would be abandoned in place; however, the Unit 2 discharge conduit, which may be needed for Future Activities, would not be completely abandoned until after Future Activities have taken place. As proposed, the Applicant would remove the vertical intake and discharge structures on the offshore ends of the conduits and would abandon in place 114 existing diffuser ports. Leaving these diffuser ports in place would minimize waste volume and preserve incidental habitat found on and

around the diffuser ports and surrounding stone blankets during 2016 marine surveys of the Units 2 and 3 discharge conduits. Three of the buoys to be removed are near the seaward end of the Units 2 and 3 intake conduits, while the other two buoys lie farther to the south (see Figure 1-2 in Section 1.0, *Introduction*).

Onshore decommissioning activities as allowed under the operating license for Units 2 and Unit 3 would move forward, although some aspects of the decommissioning activities would be subject to approval by the California Coastal Commission (CCC). See Table 6-2 and Section 5.0, *Project Alternatives Analysis*, for details on impacts and mitigation.

6.5.2 No Project Alternative

In contrast to the Proposed Project, under the No Project Alternative the following activities would not take place:

- Approval of a new CSLC Lease (existing lease is No. PRC 6785.1) to allow for the disposition (removal or abandonment) of the Lease Facilities as part of the decommissioning process. The new lease would expire in 2035.
- Disposition of the offshore conduits and components associated with Units 2 and 3, which would remain in their current position and configuration
- Removal of the existing navigational and environmental monitoring buoys

Under the No Project Alternative, onshore decommissioning activities would continue per the operating license for Units 2 and 3 granted by the NRC. Because onshore decommissioning activities would be the same under the No Project Alternative as the Proposed Project, no significant and unavoidable impacts would be eliminated with the No Project Alternative. Impacts in the marine environment would be avoided, including impacts to marine organisms and habitat, and potential adverse impacts related to marine water quality, offshore recreation, and marine vessel traffic. The beneficial effects of the Proposed Project, including improved visual quality and restoration of the onshore SONGS site, would not occur with the No Project Alternative.

The following is a comparison of the No Project Alternative to potential impacts of the Proposed Project.

- Impacts associated with hazardous and radiological materials under this alternative would not substantially differ from the Proposed Project. APMs identified for the Proposed Project (APM-1, APM-2, AMP-4, AMP-12, APM-13, and APM-14) would reduce hazardous material impacts from this alternative but not to a less-than-significant level. Impacts HAZ-1, HAZ-2, and HAZ-3 would remain significant and unavoidable.

- Aesthetic impacts under this alternative would not substantially differ from the Proposed Project. Impacts AES-1, AES-2, and AES-3 would remain beneficial, and Impact AES-4 would remain less than significant.
- The criteria air pollutant emissions from this alternative would be lower than those from the Proposed Project. However, oxides of nitrogen (NO_X) emissions impacts within the South Coast Air Quality Management District (SCAQMD) and Mojave Desert Air Quality Management District (MDAQMD) jurisdiction would remain significant and unavoidable.
- Impacts related to greenhouse gas (GHG) emissions under this alternative would be similar to the Proposed Project, although GHG emissions would be somewhat reduced due to the elimination of offshore work. As with the Proposed Project, impacts from this alternative to less than significant.
- Impacts to terrestrial biological resources would not differ from the Proposed Project as onshore decommissioning activities are expected to continue in the same manner as the Proposed Project. Impacts to marine biological resources under this alternative would be considerably less than those of the Proposed Project.
- Onshore and offshore impacts to cultural and paleontological resources would remain the same as the Proposed Project. APMs and MMs identified for the Proposed Project (APM-10, APM-11, and MMs CR/TCR-2a, CR/TCR-2b, CR/TCR-2c, CR-4a, and CR-4b) would reduce impacts from this alternative to less than significant.
- Impacts to tribal cultural resources would remain the same as the Proposed Project. APMs and MMs identified for the Proposed Project (APM-10, APM-11, and MMs CR/TCR-2a, CR/TCR-2b, and CR/TCR-2c) would reduce impacts from this alternative to less than significant.
- The No Project Alternative would reduce Impact WQ-6 (Increased Ocean Turbidity and Marine Debris) from a level of less than significant under the Proposed Project with implementation of APM-1, APM-15, and APM-16, to a level of no impact. All other impacts associated with hydrology and water quality would remain the same.
- Land use and planning impacts under this alternative would be similar to the Proposed Project. MMs identified for the Proposed Project (MMs LU-2a, LU-2b, and LU-2c) would reduce impacts from this alternative to less than significant.
- Under this alternative, there would be no intermittent restriction or prohibitions on public access to shoreline and water-dependent recreational facilities (Impact REC-1). Other recreational impacts associated with hazardous activities and deterioration of local facilities would be similar to the Proposed Project. APM-18 and the MMs identified for the Proposed Project (MMs REC-1a and REC-1b would reduce impacts from this alternative to less than significant.

- Noise levels under this alternative would be similar to the Proposed Project. Impacts NOI-1 through NOI-4 would remain less than significant.
- Impacts to geology and soils with this alternative would not differ from the Proposed Project (Impacts GEO/CP-1 and GEO/CP-2). Coastal process impacts under the No Project Alternative would not substantially differ from the Proposed Project. Impacts GEO/CP-3 through GEO/CP-5 would remain less than significant.
- Onshore traffic and transportation impacts under the No Project Alternative would not differ from the Proposed Project (Impacts TR-1 through TR-4) and would remain less than significant with the APMs identified for the Proposed Project (APM-18 through APM-22); however, impacts related to marine vessel navigation and safety would not occur (Impact TR-5).
- Impacts to utilities and public service systems under this alternative would not differ from the Proposed Project (Impacts USS-1 through USS-5).

6.5.3 Full Removal of Offshore Conduits

This alternative includes full removal of the SONGS Unit 2 and Unit 3 offshore intake and discharge conduits, fish return, navigational and environmental monitoring buoys (including anchors chains and anchors). All other aspects of this alternative would be identical to the Proposed Project. See Table 6-2 and Section 5.0, *Project Alternatives Analysis*, for more details on impacts and mitigation.

Because the onshore components of the Proposed Project would not change, no significant and unavoidable impacts associated with the Proposed Project would be eliminated by the Full Removal of Offshore Conduits Alternative. Impacts in the marine environment associated with conduit removal would be greater under the Full Removal of Offshore Conduits Alternative due to the greater intensity and larger duration of ~~conduit dispositioning~~ CSLC Lease Offshore ~~a~~Activities. These would include adverse impacts on marine organisms and habitat, marine water quality, air pollutant emissions, GHG emissions, noise, offshore recreation, noise, and marine vessel traffic. Although these impacts would be greater under the Full Removal of Offshore Conduits Alternative than the Proposed Project, these impacts could be reduced to a less-than-significant level with implementation of APMs and MMs. Because of the substantially greater amount of conduit materials removed under this alternative, it presents a greater potential than the Proposed Project for encountering hazardous substances that may exist in the conduit materials or adjacent seafloor areas. The beneficial effects of the Full Removal of Offshore Conduits Alternative, including improved onshore visual quality and restoration of the onshore SONGS site, would be the same as the Proposed Project.

The following is a comparison of potential impacts of the Full Removal of Offshore Conduits Alternative to those of the Proposed Project.

- Dredging activities under this alternative could bring material with detectable amounts of radiation to the surface, which would result in a greater impact associated with radioactive material than under the Proposed Project. APM-1, APM-4, APM-12, APM-13, and APM-14 would be implemented to reduce potential radiological impacts but not to a less-than-significant level. Radiological impacts would remain significant and unavoidable. All other impacts from non-radiological hazards under this alternative would be similar to the Proposed Project.
- Aesthetic impacts under this alternative would not substantially differ from the Proposed Project. Impacts AES-1, AES-2, and AES-3 would remain beneficial, and Impact AES-4 would remain less than significant.
- This alternative would increase criteria air pollutant emissions compared with the Proposed Project; however, this increase would be distributed over a large area and would not substantially affect air pollutant concentrations. Similar to the Proposed Project, even with implementation of APM-3 and MMs AQ-3a and AQ-3b, NO_X emissions within the SCAQMD and MDAQMD jurisdictions would exceed the significance thresholds. Additionally, due to the extensive offshore work under this alternative, emissions would also exceed the San Diego Air Pollutant Control District (SDAPCD) NO_X threshold. Impact AQ-3 would be significant and unavoidable. All other air quality impacts would remain less than significant.
- Impacts related to GHG emissions under this alternative would be similar to the Proposed Project, although GHG emissions would be somewhat higher due to the additional offshore work. However, impacts from this alternative would be less than significant.
- Impacts to terrestrial biological resources would not differ from the Proposed Project as onshore decommissioning activities are expected to continue in the same manner as the Proposed Project. Short-term impacts to marine biological resources under this alternative would be considerably greater than those of the Proposed Project. Seabed disturbance from dredging and debris accumulation (Impact BIO-10) would increase to a significant and unavoidable level. Increased noise levels could disturb marine life (Impact BIO-11) and therefore requires additional mitigation (ALT MM BIO-11a through 11d) to reduce impacts to less than significant.
- Onshore and offshore impacts to cultural and paleontological resources would remain the same as the Proposed Project. APMs and MMs identified for the Proposed Project (APM-10 and APM-11, and MMs CR/TCR-2a, CR/TCR-2b, CR-TCR-2c, CR-4a, and CR-4b) would reduce impacts from this alternative to less than significant.
- Onshore and offshore impacts to tribal cultural resources would remain the same as the Proposed Project. APMs and MMs identified for the Proposed Project (APM-

10 and APM-11, and MMs CR/TCR-2a, CR/TCR-2b, and CR/TCR-2c) would reduce impacts from this alternative to less than significant.

- Impacts to geology and soils with this alternative would not differ from the Proposed Project (Impacts GEO/CP-1 and GEO/CP-2). Impacts to coastal sediment properties (Impact GEO/CP-3) would not occur under this alternative. The remaining coastal process impacts (Impacts GEO/CP-4 and GEO/CP-5) would be identical to the Proposed Project.
- Impacts associated with hydrology and water quality under this alternative would be similar to the Proposed Project, although the impacts of marine turbidity and debris would be of longer duration and greater intensity. APMs and MMs identified for the Proposed Project (APM-1, APM-2, APM-12 through APM-17, and MM HAZ-6, MM WQ-4, and MM WQ-5) would reduce impacts from this alternative to less than significant.
- Land use and planning impacts under this alternative would be similar to the Proposed Project. MMs identified for the Proposed Project (MMs LU-2a, LU-2b, and LU-2c) would reduce impacts from this alternative to less than significant.
- Recreation and public access impacts under this alternative would be similar to the Proposed Project, although the offshore impact duration would be longer and of greater intensity. APM-18 and the MMs identified for the Proposed Project (MMs REC-1a and REC-1b) would reduce impacts from this alternative to less than significant.
- Offshore pile driving to install the trestle to support conduit removal could create underwater noise levels that would be substantially greater than the Proposed Project and may harm recreational divers, swimmers, and surfers (Impact NOI-4). With implementation of ALT MM NOI-4, ALT MM BIO-11b, APM-18, and establishment of an exclusion zone (as shown in Figure 4.13-2), temporary marine noise levels would be reduced to a less-than-significant level. All other noise impacts would be very similar or identical to the Proposed Project.
- Onshore traffic and transportation impacts under this alternative would not differ from the Proposed Project (Impacts TR-1 through TR-4) and would remain less than significant with the APMs and MMs identified for the Proposed Project (APM-19 through APM-21 and MMs REC-1a and REC-1b). Impacts related to marine vessel navigation and safety (Impact TR-5) would be similar to the Proposed Project and less than significant with implementation of APMs (APM-9, APM-15, APM-18, and APM-22).
- Impacts to utilities and public service systems under this alternative would not differ from the Proposed Project (Impacts USS-1 through USS-5).

6.5.4 Partial Removal of Offshore Conduits

This alternative includes full removal of the SONGS Unit 2 and Unit 3 offshore intake and discharge conduits from the seawall to approximately 300 feet offshore, leaving the remaining portions of the horizontal conduit and fish return conduit in place.

The onshore components of the Proposed Project would not change under this alternative and, therefore, no significant and unavoidable impacts associated with the Proposed Project would be eliminated by the Partial Removal of Offshore Conduits Alternative. Impacts in the marine environment associated with conduit removal would be greater than the Proposed Project under this alternative due to the greater intensity and larger duration of ~~conduit dispositioning~~ CSLC Lease Offshore A~~a~~ctivities, although these impacts would be reduced compared to Full Removal of Offshore Conduits Alternative (see Section 6.5.3 above). This includes adverse impacts on marine organisms and habitat, marine water quality, air pollutant emissions, greenhouse gas emissions, noise, offshore recreation, noise, and marine vessel traffic. Although these impacts would be greater under this alternative than the Proposed Project, these impacts can be reduced on a less-than-significant level with implementation of APMs and MMs. Because of the greater amount of conduit materials removed under this alternative, it presents a greater potential than the Proposed Project for encountering hazardous substances that may exist in the conduit materials or adjacent seafloor areas. The beneficial effects of the Partial Removal of Offshore Conduits Alternative, including improved onshore visual quality and restoration of the onshore SONGS site, would be the same as the Proposed Project.

The following is a comparison of potential impacts of the Partial Removal of Offshore Conduits Alternative to those of the Proposed Project.

- Dredging activities under this alternative could bring material with detectable amounts of radiation to the surface, which would result in a greater impact associated with radioactive material than under the Proposed Project. APM-1, APM-4, APM-12, APM-13, and APM-14 would be implemented to reduce potential impacts but not to a less-than-significant level. Radiological impacts would remain significant and unavoidable. All other impacts from non-radiological hazards under this alternative would be similar to the Proposed Project.
- Aesthetic impacts under this alternative would not substantially differ from the Proposed Project. Impacts AES-1, AES-2, and AES-3 would remain beneficial, and Impact AES-4 would remain less than significant.
- This alternative would increase criteria air pollutant emissions compared with the Proposed Project; however, this increase would be distributed over a large area and would not substantially affect air pollutant concentrations. Similar to the Proposed Project, even with implementation of APM-3 and MMs AQ-3a and AQ-3b, NO_X emissions within the SCAQMD and MDAQMD jurisdictions would exceed the significance thresholds. Additionally, due to the greater amount of offshore

work under this alternative, emissions would also exceed the SDAPCD NO_X threshold. Impact AQ-3 would be significant and unavoidable. All other air quality impacts would remain less than significant.

- Impacts related to GHG emissions under this alternative would be similar to the Proposed Project, although GHG emissions would be somewhat higher due to the additional offshore work. However, impacts from this alternative would be less than significant.
- Impacts to terrestrial biological resources would not differ from the Proposed Project as onshore decommissioning activities are expected to continue in the same manner as the Proposed Project. Short-term impacts to marine biological resources under this alternative would be considerably greater than those of the Proposed Project. Seabed disturbance from dredging and debris accumulation (Impact BIO-10) would increase to a significant and unavoidable level. Increased noise levels could increase disturb marine life (Impact BIO-11) and therefore requires additional mitigation (ALT MM BIO-11a through 11d) to reduce impacts to less than significant.
- Onshore and offshore impacts to cultural and paleontological resources would remain the same as the Proposed Project. APMs and MMs identified for the Proposed Project (APM-10 and APM-11, and MMs CR/TCR-2a, CR/TCR-2b, CR-TCR-2c, CR-4a, and CR-4b) would reduce impacts from this alternative to less than significant.
- Onshore and offshore impacts to tribal cultural resources would remain the same as the Proposed Project. APMs and MMs identified for the Proposed Project (APM-10 and APM-11, and MMs CR/TCR-2a, CR/TCR-2b, MM CR/TCR-2c) would reduce impacts from this alternative to less than significant.
- Impacts to geology and soils with this alternative would not differ from the Proposed Project (Impacts GEO/CP-1 and GEO/CP-2). Impacts related to coastal processes (Impacts GEO/CP-3 and GEO/CP-4) would not substantially differ from the Proposed Project and would remain less than significant. No impact would occur related to increased tsunami threats (Impact GEO/CP-5).
- Impacts associated with hydrology and water quality under this alternative would be similar to the Proposed Project, although the duration of impacts to marine turbidity and debris would be longer and of greater intensity. APMs and MMs identified for the Proposed Project (APM-1, APM-2, APM-12 through APM-17, and MM HAZ-6, MM WQ-4, and MM WQ-5) would reduce impacts from this alternative to less than significant.
- Land use and planning impacts under this alternative would be similar to the Proposed Project. MMs identified for the Proposed Project (MMs LU-2a, LU-2b, and LU-2c) would reduce impacts from this alternative to less than significant.

- Recreation and public access impacts under this alternative would be similar to the Proposed Project, although the offshore impact duration would be longer and of greater intensity. APM-18 and the MMs identified for the Proposed Project (MMs REC-1a and REC-1b) would reduce impacts from this alternative to less than significant.
- Offshore pile driving to install the trestle to support nearshore conduit removal could create underwater noise levels that would be substantially greater than the Proposed Project and may harm recreational divers, swimmers, and surfers (Impact NOI-4). With implementation of ALT MM NOI-4, ALT MM BIO-11b, APM-18, and establishment of an exclusion zone (see Figure 4.13-2) temporary marine noise levels would be reduced to a less-than-significant level. All other noise impacts would be very similar or identical to the Proposed Project.
- Onshore traffic and transportation impacts under this alternative would be greater than the Proposed Project due to the additional haul trips required for exporting removed conduit and potentially importing backfill material. However, given the magnitude of offsite truck and rail trips generated from onshore activities, the number of trips associated with removal of 300 feet of conduit and potential backfill material would not substantially change impacts (Impacts TR-1 through TR-4). Impacts related to marine vessel navigation and safety would be similar to the Proposed Project (Impact TR-5).
- Impacts to utilities and public service systems under this alternative would not differ from the Proposed Project (Impacts USS-1 through USS-5).

6.5.5 Full (or Partial) Removal of Onshore Subsurface Structures

Under this alternative, all onshore subsurface structures would be removed deeper than 3 feet (partial) or completely removed (full removal), as opposed to the Proposed Project, which would leave subsurface structures in place 3 feet below the existing local grade. The greatest impacts would be associated with full removal of subsurface structures. Impacts on the marine environment would be similar to the Proposed Project; however, certain impacts associated with the decommissioning onshore would increase. The activities associated with removal of onshore subsurface structures would involve substantial additional excavation and earth movement, and would generate numerous additional trips in order to haul excavated materials away from the site for disposal and to bring in backfill material for void spaces. This additional activity would result in increased emissions of air pollutants and greenhouse gases, and would add more truck and rail trips to the transportation network. Removal of the subsurface structures would take longer to complete than the Proposed Project and, therefore, the duration of air pollutant emissions, GHG emissions, and transportation impacts associated with this alternative would be longer. None of the significant and unavoidable impacts associated with the Proposed Project would be avoided by this alternative. The beneficial effects of this alternative, including improved visual quality and restoration of the onshore SONGS

site, would be the same as the Proposed Project. In addition, contamination in the subsurface structures and soils, if present, would be removed under this alternative.

The following is a comparison of potential impacts of the Full (or Partial) Removal of Onshore Subsurface Structures Alternative to those of the Proposed Project.

- Impacts associated with hazardous and radiological materials under this alternative would not substantially differ from the Proposed Project, although the volume of hazardous waste removed would be greater. APMs identified for the Proposed Project (APM-1, APM-4, APM-12 through APM-14) would reduce radiological impacts but not to a less-than-significant level. Radiological impacts would remain significant and unavoidable. The APMs noted above and MMs HAZ-4, HAZ-5, and HAZ-6 would reduce non-radiological hazardous material impacts from this alternative to less than significant.
- Aesthetic impacts under this alternative would not substantially differ from the Proposed Project. Impacts AES-1, AES-2, and AES-3 would remain beneficial, and Impact AES-4 would remain less than significant.
- This alternative would increase criteria air pollutant emissions compared with the Proposed Project; however, this increase would be distributed over a large area and would not substantially affect air pollutant concentrations. Similar to the Proposed Project, even with implementation of APM-3 and MMs AQ-3a and AQ-3b, NO_X emissions impacts within the SCAQMD jurisdiction would remain significant and unavoidable.
- Impacts related to GHG emissions under this alternative would be similar to the Proposed Project. GHG emissions would be somewhat higher with additional work onshore; however, impacts from this alternative would be less than significant.
- Impacts to terrestrial and marine biological resources under this alternative would not differ from the Proposed Project. APMs and MMs identified for the Proposed Project (APM-1, APM-4, APM-8, APM-9, APM-12, APM-15, APM-16, APM-17, and MMs BIO-1a through BIO-12) would reduce biological resource impacts from this alternative to less than significant.
- Onshore and offshore impacts to cultural and paleontological resources would remain the same as the Proposed Project. APMs and MMs identified for the Proposed Project (APM-10 and APM-11, and MMs CR/TCR-2a, CR/TCR-2b, CR/TCR-2c, CR-4a, and CR-4b) would reduce impacts from this alternative to less than significant.
- Onshore and offshore impacts to tribal cultural resources would remain the same as the Proposed Project. APMs and MMs identified for the Proposed Project (APM-10 and APM-11, and MMs CR/TCR-2a, CR/TCR-2b, and CR/TCR-2c) would reduce impacts from this alternative to less than significant.

- Impacts to geology and soils with this alternative would not differ from the Proposed Project (Impacts GEO/CP-1 and GEO/CP-2). Impacts to coastal sediment properties (Impact GEO/CP-1) would be beneficial under this alternative. The remaining coastal process impacts would be identical to the Proposed Project.
- Impacts associated with hydrology and water quality under this alternative would be similar to the Proposed Project. APMs and MMs identified for the Proposed Project (APM-1, APM-2, APM-12, APM-13, and APM-14 and MMs HAZ-6, WQ-4, and WQ-5) would reduce impacts from this alternative to less than significant.
- Land use and planning impacts under this alternative would be similar to the Proposed Project, although the onshore impact duration would be longer and of greater intensity. MMs identified for the Proposed Project (MMs LU-2a, LU-2b, and LU-2c) would reduce impacts from this alternative to less than significant.
- Recreation and public access impacts under this alternative would be similar to the Proposed Project, although the onshore impact duration would be longer and of greater intensity. APM-18 and the MMs identified for the Proposed Project (MMs REC-1a and REC-1b) would reduce impacts from this alternative to less than significant.
- Noise levels under this alternative would not significantly differ from the Proposed Project. Although the duration of temporary vibration may increase, all temporary vibration would attenuate to below perceptible ranges at the nearest sensitive receptors. Impacts NOI-1 through NOI-4 would remain less than significant.
- Onshore traffic and transportation impacts would increase under this alternative due to the increase in haul trips needed to remove additional waste material from the site (Impacts TR-1 through TR-4) and would remain less than significant with the APMs and MMs identified for the Proposed Project (APM-18 through APM-21, and MMs REC-1a and REC-1b). Impacts related to marine vessel navigation and safety would be similar to the Proposed Project (Impact TR-5).
- Impacts to utilities and public service systems under this alternative would not differ from the Proposed Project (Impacts USS-1 through USS-5).

Table 6-2. Summary of Impacts: Proposed Project and Alternatives

Impact	Impact Class[1]				
	Proposed Project	No Project	Offshore Conduit Removal		Removal of Onshore Subsurface Structures
			Full	Partial	
HAZ-1: Release of Hazardous Radioactive Materials During Decommissioning and Disposal	SU	SU	SU	SU	SU
HAZ-2: Additional Emergency Response Capabilities Required During Decommissioning	SU	SU	SU	SU	SU
HAZ-3: Exposure to Radioactive Groundwater Contamination	SU	SU	SU	SU	SU
HAZ-4: Handling of Non-Radiological Hazardous Wastes	LTSM	LTSM	LTSM	LTSM	LTSM
HAZ-5: Risk of Fire, Explosion, or Hazardous Material Release	LTSM	LTSM	LTSM	LTSM	LTSM
HAZ-6: Mobilization of Existing Contaminants	LTSM	LTSM	LTSM	LTSM	LTSM
AES-1: Affect a Scenic Vista	B	B	B	B	B
AES-2: Damage Scenic Resources	B	B	B	B	B
AES-3: Degrade Visual Character or Quality of Site and its Surroundings	B	B	B	B	B
AES-4: Create Light and Glare	LTS	LTS	LTS	LTS	LTS
AQ-1: Conflict or Obstruct Implementation of Applicable Air Quality Plans	LTS	LTS	LTS	LTS	LTS
AQ-2: Violation of Ambient Air Quality Standards	LTS	LTS	LTS	LTS	LTS
AQ-3: Result in a Cumulatively Considerable Net Increase in Any Criteria Air Pollutant for which the Project Region is in Nonattainment	SU	SU	SU	SU	SU
AQ-4: Expose Sensitive Receptors to Substantial Pollutant Concentrations	LTS	LTS	LTS	LTS	LTS
AQ-5: Create Objectionable Odors Affecting a Substantial Number of People	LTS	LTS	LTS	LTS	LTS
BIO-1: Contribute to the Loss and Degradation of Sensitive Habitat	LTSM	LTSM	LTSM	LTSM	LTSM
BIO-2: Adversely Affect Terrestrial Special-Status Species	LTSM	LTSM	LTSM	LTSM	LTSM
BIO-3: Disturb Non-Listed Roosting or Breeding Bats	LTSM	LTSM	LTSM	LTSM	LTSM

Table 6-2. Summary of Impacts: Proposed Project and Alternatives

Impact	Impact Class[1]				
	Proposed Project	No Project	Offshore Conduit Removal		Removal of Onshore Subsurface Structures
			Full	Partial	
BIO-4: Potential Disturbance or Degradation of Onshore Waters of the U.S./State	LTSM	LTS	LTS	LTS	LTS
BIO-5: Interfere with Established Native Resident or Migratory Wildlife Corridors	NI	NI	NI	NI	NI
BIO-6: Conflict with Adopted Conservation Plans	LTSM	LTSM	LTSM	LTSM	LTSM
BIO-7: Contribute to the Degradation of Marine Habitats	LTS	LTS	LTS	LTS	LTS
BIO-8: Risk of Oil Spill Mortality to Protected Marine Species	LTS	NI	LTS	LTS	LTS
BIO-9: Release of Hydrogen Sulfide (H_2S) Gas from Intake and Discharge Conduits	LTSM	NI	LTSM	LTSM	LTSM
BIO-10: Seabed Disturbance, Dredging, and Debris Accumulation	LTSM	NI	SU	SU	LTSM
BIO-11: Harassment of Marine Life	LTSM	NI	LTSM	LTSM	LTSM
BIO-12: Spread of Invasive and Non-Native Marine Species	LTSM	NI	LTSM	LTSM	LTSM
CR-1: Change Significance of Previously Recorded Historical, Unique Archaeological Resources	NI	NI	NI	NI	NI
CR-2: Change Significance of Previously Unidentified Historical or Unique Archaeological Resources	LTSM	LTSM	LTSM	LTSM	LTSM
CR-3: Disturb Unidentified Human Remains	LTS	LTS	LTS	LTS	LTS
CR-4: Destruction of Unique Paleontological Resources	LTSM	LTSM	LTSM	LTSM	LTSM
TCR-1: Change Significance of Previously Recorded Tribal Cultural Resources	NI	NI	NI	NI	NI
TCR-2: Change Significance of Previously Unidentified Tribal Cultural Resources	LTSM	LTSM	LTSM	LTSM	LTSM
TCR-3: Disturb Unidentified Tribal Human Remains	LTS	LTS	LTS	LTS	LTS
GEO/CP-1: Construction Triggered Landslides	NI	NI	NI	NI	NI
GEO/CP -2: Construction Triggered Erosion	LTS	LTS	LTS	LTS	LTS
GEO/CP-3: Impaired Coastal Sediment Properties	LTS	NI	NI	LTS	LTS

Table 6-2. Summary of Impacts: Proposed Project and Alternatives

Impact	Impact Class[1]				
	Proposed Project	No Project	Offshore Conduit Removal		Removal of Onshore Subsurface Structures
			Full	Partial	
GEO/CP-4: Degraded Water Wave, Current, or Circulation Patterns	LTS	NI	LTS	LTS	LTS
GEO/CP-5: Increased Tsunami Threat	NI	NI	NI	NI	NI
GHG-1: GHG Emissions from Project Activities	LTS	LTS	LTS	LTS	LTS
GHG-2: Compliance with GHG Emission Reduction Plans, Policies, or Regulations	LTS	LTS	LTS	LTS	LTS
WQ-1: Violation of Water Quality Standards or Waste Discharge Requirements, or Generation of Substantial Additional Sources of Polluted Runoff	LTS	LTS	LTS	LTS	LTS
WQ-2: Groundwater Characterization and Discharge	LTSM	LTSM	LTSM	LTSM	LTSM
WQ-3: Groundwater Depletion or Reduced Recharge	LTS	LTS	LTS	LTS	LTS
WQ-4: Erosion or Siltation due to Altered Drainage Patters	LTSM	LTSM	LTSM	LTSM	LTSM
WQ-5: Flooding due to Altered Drainage Patterns or Increased Surface Runoff	LTSM	LTSM	LTSM	LTSM	LTSM
WQ-6: Increased Ocean Turbidity and Marine Debris	LTS	NI	LTS	LTS	LTS
WQ-7: Degraded Marine Water Quality from Oil or Chemical Spills	LTS	LTS	LTS	LTS	LTS
LU-1: Consistency with Applicable Land Use Plans, Policies, or Regulations	NI	NI	NI	NI	NI
LU-2: Disrupt, Displace, or Divide Existing or Approved Land Uses	LTSM	LTSM	LTSM	LTSM	LTSM
NOI-1: Expose Sensitive Receptors to Onshore Noise Levels in Excess of Standards	LTS	LTS	LTS	LTS	LTS
NOI-2: Expose Sensitive Receptors to Excessive Groundborne Vibration or Groundborne Noise	LTS	LTS	LTS	LTS	LTS
NOI-3: Substantial Temporary or Periodic Increase in Ambient Noise Levels at Sensitive Receptors	LTS	LTS	LTS	LTS	LTS
NOI-4: Create Excessive Underwater Noise	LTS	NI	LTSM	LTSM	LTS
REC-1: Reduction of Public Access to Recreational Facilities	LTSM	NI	LTSM	LTSM	LTSM

Table 6-2. Summary of Impacts: Proposed Project and Alternatives

Impact	Impact Class[1]				
	Proposed Project	No Project	Offshore Conduit Removal		Removal of Onshore Subsurface Structures
			Full	Partial	
REC-2: Increased Use of Existing Local and Regional Parks or Other Recreational Facilities	LTS	LTS	LTS	LTS	LTS
REC-3: Create Hazards for Recreationists	LTSM	LTSM	LTSM	LTSM	LTSM
TR-1: Reduction of Local Transportation and Circulation	LTS	LTS	LTS	LTS	LTS
TR-2: Reduce Pedestrian and Bicycle Rider Safety	LTSM	LTSM	LTSM	LTSM	LTSM
TR-3: Limit Rail Operations	LTS	LTS	LTS	LTS	LTS
TR-4: Reduce Driveway Safety or Require New Traffic Signals	LTS	LTS	LTS	LTS	LTS
TR-5: Marine Vessel Safety	LTS	NI	LTS	LTS	LTS
USS-1: New or Altered Public Services or Government Facilities	LTS	LTS	LTS	LTS	LTS
USS-2: Exceed Wastewater Treatment Requirements or Capacity	LTS	LTS	LTS	LTS	LTS
USS-3: Exceed Existing Water Supply	LTS	LTS	LTS	LTS	LTS
USS-4: Exceed Landfill Capacity	LTS	LTS	LTS	LTS	LTS
USS-5: Conflict with Applicable Solid Waste Statutes and Regulations	NI	NI	NI	NI	NI

Notes: [1] Impacts are classified as according to one of the following five categories:

- SU (Significant and Unavoidable): a substantial or potentially substantial adverse change from the environmental baseline that meets or exceeds significance criteria, where either no feasible mitigation can be implemented or the impact remains significant after implementation of mitigation measures
- LTSM (Less than Significant with Mitigation): a substantial or potentially substantial adverse change from the environmental baseline that can be avoided or reduced to below applicable significance thresholds
- LTS (Less than Significant): an adverse impact that does not meet or exceed the significance criteria of a particular resource area and, therefore, does not require mitigation
- B (Beneficial): an impact that would result an improvement to the physical environment relative to baseline conditions
- NI (No Impact): a Project change that would not result in an impact to the physical environment relative to baseline condi

7.0 MITIGATION MONITORING PROGRAM

As the lead agency under the California Environmental Quality Act (CEQA), the California State Lands Commission (Commission or CSLC) is required to adopt a program for reporting or monitoring regarding the implementation of mitigation measures. As ~~proponent~~ lead agency for the SONGS Units 2 & 3 Decommissioning Project (Proposed Project), the Commission will also ensure the implementation of the adopted mitigation measures defined in this Environmental Impact Report (EIR). This lead agency responsibility originates in Public Resources Code section 21081.6, subdivision (a) (Findings), and the State Guidelines for Implementing CEQA sections 15091, subdivision (d) (Findings), and 15097 (Mitigation Monitoring or Reporting).

7.1 MONITORING AUTHORITY

The purpose of a Mitigation Monitoring Program (MMP) is to ensure that measures adopted to mitigate or avoid significant impacts are implemented. A MMP can be a working guide to facilitate the implementation of the mitigation measures and associated monitoring, compliance and reporting activities. Commission staff may delegate duties and responsibilities for monitoring to environmental monitors or consultants as deemed necessary, and some monitoring responsibilities may be assumed by responsible agencies, such as affected jurisdictions and cities. The number of construction monitors assigned to the Project will depend on the number of concurrent construction activities and their locations. Commission staff will ensure that appropriate agency reviews and approvals are obtained, that each person delegated any duties or responsibilities is qualified to monitor compliance, and that it is aware of and has approved any deviation from the MMP.

7.2 ENFORCEMENT RESPONSIBILITY

The Commission, as lead agency, is responsible for enforcing the procedures adopted for monitoring through the environmental monitor. Any assigned environmental monitor shall note problems with monitoring, notify appropriate agencies or individuals about any problems, and report the problems to Commission staff or its designee.

7.3 MITIGATION COMPLIANCE RESPONSIBILITY

The Commission is responsible for successfully implementing all the mitigation measures in the MMP, and shall ensure that these requirements are met by all construction contractors and field personnel. Standards for successful mitigation also are implicit in many mitigation measures that include such requirements as obtaining permits or avoiding a specific impact entirely. Other mitigation measures include detailed success criteria. Additional mitigation success thresholds may be established by applicable agencies with jurisdiction through the permit process and through the review and approval of specific plans for the implementation of mitigation measures.

7.4 GENERAL MONITORING PROCEDURES

7.4.1 Environmental Monitors

Many of the monitoring procedures will be conducted prior to or during the construction phase of the Project. Commission staff and its environmental monitor(s) are responsible for integrating the mitigation monitoring procedures into the construction process in coordination with the contractor. To oversee the monitoring procedures and to ensure success, the environmental monitor must be on site during that portion of construction that has the potential to create a significant environmental impact or other impact for which mitigation is required. The environmental monitor is responsible for ensuring that all procedures specified in the monitoring program are followed.

7.4.2 General Reporting Procedures

Site visits and specified monitoring procedures performed by other individuals will be reported to the environmental monitor. A monitoring record form will be submitted to the environmental monitor by the individual conducting the visit or procedure so that details of the visit can be recorded and progress tracked by the environmental monitor. A checklist will be developed and maintained by the environmental monitor to track all procedures required for each mitigation measure and to ensure that the timing specified for the procedures is adhered to. The environmental monitor will note any problems that may occur and take appropriate action to rectify the problems.

7.4.3 Public Access to Records

The public is allowed access to records and reports used to track the monitoring program. Monitoring records and reports will be made available for public inspection by the Commission or its designee on request.

7.5 MITIGATION MONITORING TABLE

This section presents the mitigation monitoring table (Table 7-1) for each environmental discipline that requires mitigation measures (Applicant-proposed measures [APMs] are presented at the end of the table. Impacts that do not require mitigation are not included (see *Executive Summary* for summary description of all Project impacts). Each table lists the following information, by column:

- Impact (impact number and title)
- Mitigation Measure (full text of the measure)
- Location (where the impact occurs and the mitigation measure should be applied)
- Monitoring/reporting action (the action to be taken by the monitor or lead agency)
- Effectiveness criteria (how the agency can know if the measure is effective)
- Responsible Party
- Timing (before, during, or after construction; during operation, etc.)

Table 7-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring / Reporting Action	Timing	Responsible Party	Effectiveness Criteria
Hazardous and Radiological Materials						
HAZ-1: Release of Hazardous Radioactive Materials during Decommissioning and Disposal	**APM-1: Waste Management Program.** The Applicant ~~and/~~or its contractor shall prepare and implement a Waste Management Program ~~prior to decommissioning~~. The Program shall be submitted to California State Lands Commission staff at least 60 days prior to the commencement of Proposed Project waste shipment activities. The Program shall include, but not be limited to the following: • Processes for identification, characterization, handling, transport, and disposal of the various radiological and non-radiological waste types • Training for waste management personnel • Procedures for documentation of all shipments in accordance with applicable regulations established by the appropriate governing agencies (e.g., Nuclear Regulatory Commission or California Department of Toxic Substances Control) for various radiological and non-radiological waste types Specifications that the Program shall only use qualified and permitted waste disposal carriers and disposal facilities licensed for the specific waste stream to be transported.	Onshore/ Offshore	Compliance	Prior and during ~~decommissioning~~ Proposed Project waste shipment activities	Applicant or contractor	Reduce impacts related to waste disposal
	APM-4: Dust Suppression. During Proposed Project activities, disturbed Project area surfaces, including unpaved access roads, shall be effectively stabilized of dust emissions (e.g., watered, covered, stabilized, or treated with a dust suppressant), consistent	Onshore	Compliance with the SWPPP as determined by San Diego RWQCB	During ~~decommissiong~~ Proposed Project activities	Applicant ~~and/~~or contractor	Reduce impacts associated with air quality

Table 7-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring / Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	with the Storm Water Pollution and Prevention Plan.					
	APM-12: Stormwater Pollution Prevention Plan (SWPPP). The Applicant ~~and/~~or its contractor shall obtain coverage for the Proposed Project under the Construction General Permit (Order No. 2009-009-DWQ, as amended by 2010-0014-DWQ and 2012-006-DWQ). Per the requirements of the California State Water Resources Control Board (SWRCB), the Applicant ~~and/~~or its contractor shall prepare a SWPPP to reduce the potential for water pollution and sedimentation from Proposed Project activities. The SWPPP will be project specific and expressly address site runoff, assuring that project runoff would not affect or alter drainage patterns to sensitive habitat, including but not limited to vernal pool habitat. The SWPPP shall set forth a best management practices including, but not limited to the following: • Silt fences, fiber rolls, and other measures shall be placed where they are determined to be appropriate for erosion and sediment control • A monitoring, maintenance, and reporting schedule shall be prepared and implemented and shall identify the responsible entities The Applicant ~~and/~~or its contractor shall notify California State Lands Commission staff that the SWPPP has been certified and is available in the SWRCB's Stormwater Multiple Applications and Reports Tracking System not	Onshore	Notification to CSLC staff that the SWPPP has been certified	Prior to and during ~~decommissioning~~ Proposed Project activities	Applicant ~~and/~~or contractor	Reduce impacts associated with water quality

Table 7-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring / Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	less than ~~60~~30 days prior to commencement of ground disturbing activities.					
	APM-13: Spill Prevention Control and Countermeasure (SPCC) Plan. The Applicant ~~and/~~or its contractor shall continue compliance with the requirements of the U.S. Environmental Protection Agency (U.S. EPA; 40 CFR Part 112) through continued use of the existing SONGS SPCC Plan, including amendments as required. The SPCC is certified by a licensed professional engineer and then provided to the U.S. EPA's Regional Administrator (San Diego County Department of Environmental Health, Hazardous Materials Division). The SPCC Plan shall continue to include, but is not and shall not be limited to the following: • A facility description • A complete list of all oil storage containers (aboveground containers and completely buried tanks) with a capacity of 55 U.S. gallons or more. • A description of tanks and containers with the potential for an oil discharge; mode of failure, flow direction and potential quantity of the discharge; and the secondary containment method and containment capacity provided • A description of the inspection or testing program for all aboveground bulk storage containers including record-keeping of these inspections or tests • A requirement for training of oil-handling personnel in the operation and maintenance of equipment to prevent	Onshore	Submittal of initial ~~C~~certified SPCC Plan for the Proposed Project to CSLC staff for ~~consultation,~~ review~~, and approval~~	Prior to and during ~~decommissioning~~ Proposed Project activities	Applicant ~~and/~~or contractor	Reduce impacts associated with water quality

Table 7-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring / Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	discharges; discharge procedure protocols; applicable pollution control laws, rules and regulations; general facility operations; and the contents of the SPCC Plan • A requirement for annual discharge prevention briefings conducted for all oil-handling personnel. Briefings would highlight and describe past reportable discharges or failures, malfunctioning components, and any recently developed precautionary measures • Implementation of security measures to prevent unauthorized access to oil handling and/or storage area(s) • A description of immediate actions to be taken by facility personnel in the event of a discharge to navigable waters or adjoining shorelines The Applicant or its contractor shall submit the initial certified Plan to California State Lands Commission (CSLC) staff for review ~~and approval by CSLC staff~~, in consultation with the U.S. EPA and California Coastal Commission staffs, not less than 30 days prior to commencement of Proposed Project activities. In accordance with regulatory requirements, the Spill Contingency Plan and any subsequent updates will be available for review onsite throughout the Proposed Project for review.					
	APM-14: Spill Contingency Plan. The Applicant ~~and/~~or its contractor shall maintain compliance with the requirements of the U.S. Environmental Protection Agency (40 CFR Part 112) through implementation of the	Onshore	Submittal of initial Spill Contingency Plan for the Proposed	Prior to and during ~~decommissioning~~ Proposed Project activities	Applicant ~~and/~~or contractor	Reduce impacts associated

Table 7-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring / Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	existing Spill Prevention Control and Countermeasure Plan, including amendments if required, that describes the actions facility personnel shall take in response to hazards to human health or the environment from fires, explosions, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil, or surface water during the Proposed Project. At a minimum, the Spill Contingency Plan shall include: • A description of all arrangements agreed to by local police departments, local and federal fire departments, hospitals, contractors, and state and local emergency response teams to coordinate emergency services • Names, addresses, and phone numbers (office and home) of all persons designated to act as primary and alternate emergency coordinators • A list of all emergency equipment at the facility (such as fire extinguishing systems, spill control equipment, communications and alarm systems (internal and external), and decontamination equipment), as required, as well as the location and a physical description of each item on the list, and a brief outline of its capabilities • An evacuation plan that includes evacuation procedures and instructions, as well as primary and alternate evacuation route • Procedures to be followed for notification and reporting of hazardous releases		Project to CSLC staff for ~~consultation,~~ review ~~and approval~~			with water quality

Table 7-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring / Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	• The current telephone number of the State Office of Emergency Services The Applicant or its contractor shall submit the initial Plan to California State Lands Commission (CSLC) staff, for review ~~and approval by CSLC staff~~ in consultation with the Regional Water Quality Control Board and California Coastal Commission staffs, not less than 30 days prior to commencement of Proposed Project activities. In accordance with regulatory requirements, the Spill Contingency Plan and any subsequent updates will be maintained onsite throughout the Proposed Project for review.					
HAZ-4: Handling of Non-Radiological Hazardous Wastes	**MM HAZ-4: Facility Hazardous Waste Permit Extension.** The Applicant ~~and/~~or its contractor shall coordinate with the California Department of Toxic Substances Control to ~~add all decommissioning activities to the existing facility permit and~~ obtain time extensions or amendments to the Hazardous Waste Facility Permit as necessary ~~until all regulated waste is removed from the site~~. A copy of the Hazardous Waste Permit Extension shall be provided to the California State Lands Commission 2 weeks prior to the ~~start of decommissioning activities~~ expiration of the existing Hazardous Waste Facility Permit.	Onshore and Offshore	Copy of permit extension to CSLC staff	Two weeks ~~P~~prior to ~~decommissioning activities~~ the expiration of the existing Hazardous Waste Facility Permit	Applicant ~~and/~~or contractor	Reduce impacts associated with hazardous wastes~~.~~
	Implement APM-1 (provided above)					
	APM-2: Hazardous Materials Business Plan (HMBP). The existing HMBP shall continue to be updated as required by law and as	Onshore	Certified HMBP Plan to CSLC staff	Prior to and during ~~decommissioning~~	Applicant ~~and/~~or contractor	Reduce impacts associated

Table 7-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring / Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	prescribed by the County of San Diego, Department of Environmental Health, Hazardous Materials Division (County HMD), but not less than annually. The Plan shall include: • A detailed hazardous materials inventory for the site • Emergency contacts, a site plan, and response strategies • Procedures for on-site refueling (refueling stations and fuel tanks locations, maintenance, and operation The HMBP shall be uploaded to the California Environmental Reporting System per County HMD requirements, and the certified document submitted to California State Lands Commission staff at least 30 days prior to the commencement of Proposed Project decontamination and dismantlement activities and annually thereafter while Proposed Project activities are occurring.			Proposed Project activities		with water quality
HAZ-5: Risk of Fire, Explosion, or Hazardous Material Release	**MM HAZ-5: Worker Registration/ Certification.** The Applicant ~~and/~~or its contractor shall require workers ~~to have the required registrations to~~ removinge asbestos, lead-based paint, and other hazardous materials to have the required registrations. The Applicant or its contractor shall submit a list of all workers with certification records to California State Lands Commission staff 60 days prior to the ~~start of demolition~~implementation of applicable activities, and a list every 60 days thereafter,	Onshore and Offshore	Worker certifications to CSLC staff	Prior to and during ~~decommissioning~~ Proposed Project activities	Applicant ~~and/~~or contractor	Reduce impacts associated with hazardous wastes~~.~~

Table 7-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring / Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	as long as the work requiring such certifications is occurring.					
	Implement APM-1, APM-12, APM-13, and APM-14 (provided above)					
HAZ-6: Mobilization of Existing Contaminants	**MM HAZ-6: Soil and Groundwater Site Characterization ~~Study~~ and Soil Management Plan.** The Applicant or its contractor shall prepare a comprehensive Site Characterization ~~Study~~ and Soil Management Plan for non-radiological contamination testing, which shall include: • Subsurface soil and groundwater sampling, after site safety constraints have been addressed (i.e., underground utilities deactivated or removed) • An investigation work plan, including boring and sampling locations, to investigate where known and suspected soil and groundwater contamination may be present • Identification of the limits of contamination based on the results of the soil and groundwater testing, and procedures to protect workers during excavation, handling, and disposal of materials exceeding regulatory limits • A Soil Management Plan for the identification and disposal of potentially contaminated soil, which shall: o Consider that some contaminated soil may be present outside the limits identified in the soil characterization study o Include the required qualifications for professionals who shall monitor soil conditions, conduct soil sampling,	Onshore	~~Study and~~ Plan to CSLC staff for review. Compliance with ~~Monthly~~ Quarterly soil ~~monitoring~~ sampling reports to County of San Diego, Dept. of Environmental Health, Hazardous Materials Division.	Prior to and during ~~decommissioning~~ Proposed Project activities	Applicant or contractor	Reduce mobilization of contaminants

Table 7-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring / Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	coordinate laboratory testing, oversee soil excavation and disposal, determine the anticipated field screening methods, and appropriate regulatory limits o Contain requirements for documentation and reporting of incidents of encountered contaminants, such as documenting locations of occurrence, sampling results, and reporting actions taken to remediate non-radiological contaminated materials The Applicant or its contractor shall submit the ~~Study and~~ Plan to California State Lands Commission staff a minimum of 60 days prior to ~~decommissioning~~ the start of Proposed Project activities, for review. In addition, ~~monthly~~ quarterly soil ~~monitoring~~ sampling reports shall be submitted to the County of San Diego, Department of Environmental Health, Hazardous Materials Division.					
	Implement APM-12 (provided above)					
Air Quality						
AQ-3: Result in a Cumulatively Considerable Net Increase of Any Criteria Air Pollutant for which the Project Region is in Nonattainment	**MM AQ-3a. Off-Road Equipment Emissions Control.** Off-road diesel-fueled equipment, not including locomotive and marine vessel engines, with engines larger than 50 horsepower shall have engines that meet or exceed U.S. Environmental Protection Agency/California Air Resources Board full Tier 4 emissions standards. This includes Project-related off-road equipment operating at the SONGS site and the Project-related equipment operating at the Port of Long Beach/Los Angeles. Exceptions shall be allowed only on a case-by-case basis for three	Onshore	Compliance	During ~~decommissioning~~ Proposed Project activities	Applicant ~~and/~~or contractor	Reduce impacts associated with air quality

Table 7-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring / Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	specific situations: (1) interim Tier 4 equipment shall be allowed in place of full Tier 4 equipment through the end of calendar year 2020; (2) off-road equipment items that are a specialty, or unique, piece of equipment that cannot be found with a Tier 4 or better engine after a due diligence search that includes contacting at least three relevant equipment rental firms; and (3) an off-road equipment item that shall be used for a total of no more than 10 days. Additionally, all engines shall be maintained in good operating condition and in tune per manufacturers' specification.					
	MM AQ-3b. Marine Vessel Emissions Control. The Applicant or its contractor shall ensure that diesel-fueled marine vessel engines (37 kilowatt or larger) meet or exceed U.S. Environmental Protection Agency Tier 2 emissions standards.	Offshore	Compliance	During ~~decommissioning~~ Proposed Project activities	Applicant or contractor	Reduce impacts associated with air quality
	APM-3: Vehicle Emission Reductions. The Applicant ~~and/~~or its contractor shall, employ vehicle emissions reduction measures which could include, but are not limited to: the use of newer model engines (model year 2010 and newer), low emissions diesel products, alternative fuels, engine retrofit technology, after-treatment products, or other similar available options. The following exceptions apply: • This measure does not apply to any gasoline-fueled or other alternatively fueled heavy-duty haul trucks, but does apply to	Onshore	Compliance	Prior to and during ~~decommissioning~~ Proposed Project activities	Applicant ~~and/~~or contractor	Reduce impacts associated with air quality

Table 7-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring / Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	trucks using other types of fuel such as diesel. • This measure does not apply to the trucks used to haul radioactive Class B or C decommissioning wastes.					
AQ-4: Expose Sensitive Receptors to Substantial Pollutant Concentrations	**Implement MM AQ-3a and MM AQ-3b and APM-3 (~~see~~provided above)**					
	APM-4: Dust Suppression. During Proposed Project activities, disturbed Project area surfaces, including unpaved access roads, shall be effectively stabilized of dust emissions (e.g., watered, covered, stabilized, or treated with a dust suppressant), consistent with the Storm Water Pollution and Prevention Plan.	Onshore	Compliance with SWPPP as determined by San Diego RWQCB	Prior to and during ~~decommissioning~~ Proposed Project activities	Applicant ~~and/~~or contractor	Reduce impacts associated with air quality
	APM-5: Vehicle Speeds. Decommissioning crew vehicle speeds on unpaved roadways shall be restricted to 15 miles per hour or less, in accordance with SONGS procedures.	Onshore	Compliance	~~Prior to and d~~During ~~decommissioning~~ Proposed Project activities	Applicant ~~and/~~or contractor	Reduce impacts associated with air quality
	APM-6: Track-Out to Public Streets. Gravel or track-out control devices, such as shaker plates, shall be installed at the points of egress from the unpaved or disturbed surfaces, consistent with the Storm Water Pollution and Prevention Plan.	Onshore	Compliance with SWPPP as determined by San Diego RWQCB	Prior to and during ~~decommissioning~~ Proposed Project activities	Applicant ~~and/~~or contractor	Reduce impacts associated with air quality
	APM-7: Tarping Trucks. Consistent with the Storm Water Pollution and Prevention Plan, haul trucks transporting material with potential to generate fugitive dust emissions to and from the site shall be tarped from the point of origin until point of delivery. For trucks that cannot be tarped, the Applicant ~~and/~~or its contractor shall stabilize material while loading	Onshore	Compliance with SWPPP as determined by San Diego RWQCB	Prior to and during ~~decommissioning~~ Proposed Project activities	Applicant ~~and/~~or contractor	Reduce impacts associated with air quality

Table 7-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring / Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	to reduce fugitive dust emissions; maintain at least 6 inches of freeboard on haul vehicles; and, stabilize material while transporting.					
Biological Resources						
BIO-1: Contribute to the Loss and Degradation of Sensitive Habitat	**MM BIO-1a: Worker Environmental Awareness Program.** A Worker Environmental Awareness Program (WEAP) shall be developed and provided to California State Lands Commission (CSLC) staff for review and approval at least 60 days prior to Proposed Project implementation. The WEAP shall include: • A CSLC-approved biologist to conduct the training who is qualified to discuss both potential onshore and offshore species • A discussion of all sensitive species that may be encountered adjacent to and at the Proposed Project site, the laws and codes that regulate these species, and the protection measures that must be followed to avoid and minimize impacts • The process of reporting any dead or injured special-status wildlife species found at the Proposed Project site, including notification to the CSLC and applicable agencies ~~Prior to Project implementation, t~~The Applicant or its contractor shall provide to the CSLC evidence that all on-site personnel have completed the educational training prior to the start of ~~ground disturbance~~work onsite. A weather-protected bulletin board or binder shall be centrally placed or kept on site in an easily accessible area for the Project duration.	Onshore	Provide WEAP to CSLC staff for review and approval and evidence of training attendance	Prior to ~~decommissioning~~ Proposed Project ground-disturbing activities	Applicant ~~and/~~or contractor	Reduce impacts to wildlife and special-status species

Table 7-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring / Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	MM BIO-1b: ~~Habitat Restoration and Revegetation Plan~~Weed Management. To control the introduction and spread of invasive weed species in disturbed areas, measures shall be implemented following the completion of Proposed Project activities, where necessary. Control measures may include physical (hand-pulling, mechanical removal) and chemical (herbicide application) treatment methods. These control methods shall be dependent on the weed species, location of the weeds, and the time of year that weed control operations occur. Vehicles that will travel off-pavement and tools such as chainsaws, hand clippers, pruners, etc. shall be washed before and after entering all unpaved Project work areas. Logs of equipment and tools washed shall be available to the CSLC for inspection at any time. ~~The Applicant shall prepare a Habitat Restoration and Revegetation Plan. The Plan shall include:~~ • ~~Plans for soil-contouring, restoration, enhancement, and revegetation of soil exposed by removal of hardscape within the San Onofre Nuclear Generating Station facility, which shall include at a minimum (a) the plant species to be used; (b) seed and cutting collecting guidelines; (c) a schematic depicting the mitigation area; (d) time of year that the planting will occur and the methodology of the planting; (e) a description of the irrigation methodology for container, bareroot, or other planting needing irrigation; (f) measures to control~~	Onshore	~~Provide Habitat Restoration and Revegetation Plan to CSLC staff for consultation, review, and approval~~ Compliance	Post-~~decommissioning~~ Proposed Project activities	Applicant or contractor	Reduce impacts to wildlife and special-status species habitat

Table 7-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring / Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	~~exotic vegetation on site; (g) success criteria; (h) a detailed monitoring program; and a (i) a weed monitoring plan~~ • ~~Weed monitoring shall include restoration areas and controlling the spread of invasive plants in demolition areas. Measures to control the introduction and spread of noxious weeds in the Project work area shall be taken as follows: (1) all plant materials used during restoration shall be native, certified weed-free, and approved by the California State Lands Commission (CSLC) and Department of the Navy (DoN) staffs; (2) site-dedicated vehicles shall be used to the extent feasible and all equipment accessing unpaved areas from off-site shall be washed (including wheels, undercarriages, and bumpers) at existing construction yards or legally operating car washes before entering unpaved areas; (3) tools such as chainsaws, hand clippers, pruners, etc. shall be washed before and after entering all unpaved project work areas; (a written daily log shall be kept for all vehicle/equipment/tool washing that states the date, time, location, type of equipment washed, methods used, and staff present. Logs shall be available to the CSLC and DoN staffs for inspection at any time and shall be submitted monthly~~ ~~The Applicant shall submit the Plan to CSLC staff, for review and approval by CSLC staff in consultation with the DoN, U.S. Fish and Wildlife Service, and California Department of~~					

Table 7-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring / Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	~~Fish and Wildlife staffs, no more than 60 days after completion of demolition activities.~~					
	MM BIO-1c: Rare Plant Surveys. The Applicant or its contractor shall implement the following tasks to mitigate the Project's direct and indirect impacts to special-status plants. • **Surveys**. Prior to initial ground disturbance, a California State Lands Commission (CSLC)-approved, qualified plant ecologist or botanist shall conduct surveys for special-status plants (state- and federally-listed threatened and endangered, proposed, petitioned, and candidate plants and California Rare Plant Rank [CRPR] 1 and 2 plants) in all areas subject to ground-disturbing activity containing suitable habitat and the surrounding areas within 100 feet when access is feasible. The surveys shall be conducted during the appropriate blooming period(s) according to protocols established by the U.S. Fish and Wildlife Service (USFWS), California Department of Fish and Wildlife (CDFW), and California Native Plant Society (CNPS). Surveys shall be valid for a period of 3 years. If vegetation removal or initial site disturbance in a surveyed area does not occur within 3 years, surveys must be repeated. All listed plant species found shall be marked and avoided, if feasible. • Any populations of special-status plants found during surveys shall be fully described, mapped, and a CNPS Field Survey Form or written equivalent shall be prepared. A report detailing the results of	Onshore	Compliance and provide Salvage and Relocation Plan to CSLC staff for consultation, review, and approval, if needed	Prior to and~~,~~ during~~, and post decommissioning~~ Proposed Project activities	Applicant or contractor	Reduce impacts to rare plants

Table 7-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring / Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	each rare plant survey shall be provided to the CSLC staff 30 days prior to ground disturbance. • **Avoidance**. Prior to any grading, vegetation clearing, or site disturbance, the Applicant or its contractor shall delineate the limits of disturbance with lathe, snow fencing, or other suitable markers. Prior to grading or vegetation removal, any populations of special-status plants (and areas of ESHA) identified during the surveys within the Proposed Project footprint and surrounding 100-foot area shall be protected and construction fencing established around each population. The buffer for herbaceous and shrub species shall be, at a minimum, 50 feet from the perimeter of the population or the individual. A smaller buffer may be established, provided there are adequate measures in place to avoid the take of the species, in coordination with USFWS and CDFW staffs. If impacts to listed plants cannot be avoided, USFWS and CDFW staffs shall be consulted for authorization, with notification to the CSLC. If Project activities result in the loss of more than 10 percent of an onsite population of any CRPR 1 plant species, mitigation shall be required as described below. • **Salvage**. If Project activities result in the loss of more than 10 percent of an onsite population of any CRPR 1 plant species, the Applicant or its contractor shall develop a Salvage and Relocation Plan based on the life history of the species affected. The					

Table 7-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring / Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	Plan shall include at minimum: (a) collection/salvage measures for plants or seed banks, to retain intact soil conditions and maximize success likelihood; (b) details regarding storage of plants or seed banks; (c) location of the proposed recipient site, and detailed site preparation and plant introduction techniques; (d) time of year that the salvage and replanting or seeding will occur and the methodology of the replanting; (e) a description of the irrigation, if used; (f) success criteria; and (g) a detailed monitoring program, commensurate with the Plan's goals. The Salvage and Relocation Plan shall be submitted to CSLC staff for review and approval by CSLC staff in consultation with USFWS and CDFW staffs, a minimum of 30 days prior to start of salvage activities.					
	Implementation of APM-4 and APM-12 (provided above)					
BIO-2: Adversely Affect Terrestrial Special-Status Species	**MM BIO-2a: Special-Status Reptiles and Amphibians**. Prior to any ground disturbance ~~and daily during decommissioning activities,~~ to the coastal sage scrub in the Supplemental Support Areas (SSAs) and the ruderal habitat in the North Owner Controlled Area (NOCA), the Applicant or its contractor shall retain a qualified herpetologist(s) with demonstrated expertise and all required permits to handle special-status reptiles and amphibians that could occur onsite. The herpetologist(s) shall survey the SSA and NOCA habitat areas prior to ground-disturbing activities and monitor the areas daily when Proposed Project activities would occur. ~~, to survey and monitor the~~	Onshore	Compliance and provide survey results to CSLC staff for consultation~~,~~ and review~~, and approval~~	Prior to and during ~~decommissioning~~ Proposed Project activities	Applicant or contractor	Reduce impacts to special-status reptiles and amphibians

Table 7-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring / Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	~~reconfiguration of site access roads and external demolition activities proposed within the Supplemental Support Area.~~ In addition: • Any special-status reptiles or amphibians found within a Project impact area shall be relocated to suitable habitat outside the impact area by the biological monitor(s) in coordination with the U.S. Fish and Wildlife Service (USFWS) or the California Department of Fish and Wildlife (CDFW) • The biological monitor(s) shall have the authority to temporarily halt work to avoid impacts to special-status species or other protected biological resources • Survey results shall be provided to California State Lands Commission, Department of the Navy, USFWS, and CDFW staffs within 30 days of the survey.					
	MM BIO-2b: Surveys and Monitoring for ~~Breeding~~Nesting Birds. A qualified biologist with demonstrable experience surveying for active bird nests and monitoring shall conduct surveys for breeding birds protected by the Migratory Bird Treaty Act and Fish and Game Code no more than 72 hours prior to construction and removal activities carried out during the breeding season (from February 1 to September 15). In addition: • Nesting bird surveys shall be performed in all potential nesting habitat within 500 feet of construction activities, including stationary construction equipment and structures to be removed. The 500-foot survey area may be reduced if topography	Onshore	Compliance and provide survey and monitoring results	Prior to and during ~~decommissioning~~ Proposed Project activities	Applicant or contractor	Reduce impacts to special-status reptiles and amphibians

Table 7-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring / Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	and/or buildings screen visual and noise impacts. • If an active nest is detected, a no-disturbance buffer around the active nest site(s) (typically 300 feet for most species and up to 500 feet for raptors) shall be established around the nest. For a non-listed species, ~~T~~the prescribed buffer may be adjusted by the biologist in coordination with the U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Wildlife (CDFW), and the Department of the Navy (DoN). The biologist shall conduct regular monitoring of the nest to determine success/failure and to ensure that Project activities are not conducted within the buffer(s) until the nesting cycle is complete. • The biologist shall be responsible for documenting the results of the surveys and the ongoing monitoring and shall provide a copy of the survey and monitoring reports to the California State Lands Commission, DoN, USFWS, and CDFW staffs within 30 days of the survey.					
	MM BIO-2c: Burrowing Owl. A qualified biologist with demonstrable experience surveying and monitoring active burrowing owl burrows shall conduct focused burrowing owl surveys no more than 72 hours prior to: (1) the disturbance of coastal sage scrub and ruderal habitat types regardless of time of year, with the survey area to include the Proposed Project area in addition to a 500-foot buffer around the Proposed Project area;	Onshore	Compliance and provide survey results CSLC, DoN, USFWS, and CDFW staffs	Prior to and during ~~decommissioning~~ Proposed Project activities	Applicant or contractor	Reduce impacts to burrowing owl

Table 7-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring / Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	and (2) demolition or ground disturbing activities occurring during the breeding season (between February 1 and August 31), with the survey area to include all potentially occupied habitat within 500 feet of demolition or ground disturbing activities. • Focused surveys shall follow the protocols set forth in the Staff Report on Burrowing Owl Mitigation (California Department of Fish and Game 2012). • Should an inhabited nest be identified, direct impacts to active nest burrows shall be prohibited until the young have fledged, and shall only proceed after replacement burrows have been provided outside of the disturbance and 500-foot buffer areas. Demolition and ground disturbance shall be prohibited within 500 feet of active nest burrows to allow adults to raise young until fledglings can forage independently. The prescribed buffer may be adjusted by the biologist in coordination with the U.S. Fish and Wildlife Service (USFWS), California Department of Fish and Wildlife (CDFW), and the Department of the Navy (DoN). • A copy of the survey reports shall be provided to California State Lands Commission, DoN, USFWS, and CDFW staffs within 30 days of the survey.					
	MM BIO-2d: Western Snowy Plover/California Least Tern. A qualified biologist with demonstrable experience surveying and monitoring western snowy plovers, California least tern, and their nests shall conduct surveys of appropriate habitat	Onshore	Compliance and provide survey results and species avoidance plan	Prior to and during ~~decommissioning~~ Proposed Project activities	Applicant or contractor	Reduce impacts to Western Snowy Plover/

Table 7-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring / Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	for these species and their nests within 500 feet of the Project site no more than 72 hours prior to ground disturbing activities occurring during the breeding season (March 1 to August 31). • If an active nesting site is observed during the surveys, a no-disturbance buffer shall be maintained 500 feet from the site and work in the area shall be postponed until the young have fledged. The prescribed buffer may be adjusted by the qualified biologist in coordination with U.S. Fish and Wildlife Service (USFWS), California Department of Fish and Wildlife (CDFW), and the Department of the Navy (DoN). • If individuals are observed outside of the breeding season within 500 feet of the work area, the qualified biologist shall establish a no-disturbance buffer until it can be verified that the individuals have left the area. If individuals are routinely observed in or within 500 feet of the work area, or do not leave the work area, a species avoidance plan shall be developed in coordination with USFWS and CDFW. • If no individuals are observed in accordance with the survey protocols, no buffers shall be required. • A copy of the survey reports shall be provided to California State Lands Commission (CSLC), DoN, USFWS, and CDFW staffs within 30 days of the survey, and (if required) the species avoidance plan shall be submitted to CSLC staff for review		(if required) to CSLC, DoN, USFWS, and CDFW staffs			California Least Tern

Table 7-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring / Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	and approval in coordination with other agencies.					
	MM BIO-2e: Coastal California Gnatcatcher. A qualified avian biologist with appropriate federal permits shall conduct protocol-level surveys for coastal California gnatcatchers in coastal sage scrub habitat within 500 feet of ground disturbing and construction activities. The surveys shall include at least one survey no more than 72 hours prior to construction activities during the nesting season (February 15 to August 31) until the completion of ~~decommissioning~~ Proposed Project activities. The surveys shall include at least one survey no more than 72 hours prior to construction activities. • If an active nest is detected, demolition activities shall be prohibited within a 500-foot buffer until the nestling(s) has fledged, as determined by the biologist. The prescribed buffer may be adjusted by the biologist in consultation with the U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Wildlife (CDFW). • The surveys and monitoring reports shall be submitted to California State Lands Commission, Department of the Navy, USFWS, and CDFW staffs within 30 days of the survey or monitoring event.	Onshore	Compliance and provide survey and monitoring results to CSLC, DoN, USFWS, and CDFW staffs	Prior to and during ~~decommissioning~~ Proposed Project activities	Applicant or contractor	Reduce impacts to Coastal California Gnatcatcher
	MM BIO-2f: Noise Minimization Plan. The Applicant or its contractor shall prepare a Noise Minimization Plan which shall identify expected noise levels at Environmentally	Onshore	Compliance and provide survey for review and approval, and	Prior to and during ~~decommissioning~~	Applicant or contractor	Reduce impacts to Coastal

Table 7-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring / Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	Sensitive Habitat Areas (ESHAs) where sensitive bird species may breed/nest, and shall describe all measures that will be implemented to minimize Proposed Project-generated noise within those areas. The plan shall include: • A description of the basis for the expected noise levels at ESHAs and identification of modeling methods used to determine those levels • Identification of all measures to be implemented to reduce sound levels within those areas to no greater than 60 dBA or 5 dBA above ambient noise levels when active nests are present. Measures may include enclosing sound-generating sources within structures or temporary sound barriers, moving sound-generating sources to locations farther from these boundaries, reducing the number of concurrent sound generating activities, using sound baffles to redirect sound away from the ESHAs, timing restrictions, or other similarly effective measures needed to meet the 60 dBA limit or 5 dBA below ambient noise levels • The location and a description of sound monitoring equipment that will allow continuous monitoring of sound levels during Proposed ~~p~~Project activities • A description of how monitoring data will be compiled and reported to allow confirmation that sound levels do not exceed 60 dBA or 5 dBA above ambient levels within those areas when active nests are present		monitoring results to CSLC, USFWS, and CDFW staffs	Proposed Project activities		California Gnatcatcher

Table 7-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring / Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	The Noise Minimization Plan shall be submitted to CSLC staff for review and approval by CSLC staff, in consultation with USFWS and CDFW staffs, a minimum of 60 days prior to start of ~~decommissioning~~ Proposed Project activities.					
	Implement MM BIO-1a and MM BIO-1b, and APM-4, and APM-12 (provided above)					
	APM-8: Nesting Bird Deterrents. The Applicant ~~and/~~or its contractor shall implement nesting bird deterrents to deter nesting within and adjacent to active decommissioning areas. ~~A qualified biologist shall inspect the proposed deterrent area for active nests and wildlife before implementing any deterrents.~~ Deterrents ~~that may be conducted without oversight from California State Lands Commission (CSLC) or regulatory agency staff~~ could include, but are not limited to, the following: • Prior to the nesting season, remove vegetation from areas that would be directly disturbed by Proposed Project Decontamination and Dismantlement activities • Create disturbance by removing or moving equipment, vehicles, and materials on a daily basis within active decommissioning areas and yards • Use mooring balls placed in inactive nests, directly on structures, or in other potential nest locations • Install appropriate-sized mesh netting on decommissioning equipment and materials in staging areas, laydown yards,	Onshore	Compliance and consult with CSLC~~, CCC,~~ and CDFW staffs, as needed.	Prior to and during ~~decommissioning~~ Proposed Project activities	Applicant or contractor	Reduce impacts to nesting birds

Table 7-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring / Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	and other Proposed Project facilities and work areas • Place wires or wire spikes on towers, buildings, or other facilities to discourage birds from perching and nesting on these structures • Hire a U.S. Fish and Wildlife-permitted falconer to fly raptors in the area to deter birds from perching or nesting on structures • Install visual deterrents such as tangle guard bird repellent ribbon in active decommissioning areas, yards, and on materials and equipment • Cover straw wattle and other potential nesting materials in active decommissioning areas and yards ~~with tarp or another material that does not pose wildlife entrapment hazards~~ • Wrap, stuff, or cover ends of pipes or other materials within which birds could nest • Use colored gravel, such as red or white, in active decommissioning areas and yards • Manage trash in a manner to reduce potential point food sources in active decommissioning areas and yards ~~• Create disturbance by removing or moving equipment, vehicles, and materials on a daily basis within active decommissioning areas and yards~~ ~~• Install appropriate-sized mesh netting on decommissioning equipment and materials in staging areas, laydown yards,~~					

Table 7-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring / Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	~~and other Proposed Project facilities and work areas. To prevent wildlife entrapment hazards, no monofilament netting will be used~~ • ~~Use mooring balls placed in inactive nests, directly on structures, or in other potential nest locations~~ • ~~Install visual deterrents such as tangle guard bird repellent ribbon in active decommissioning areas, yards, and on materials and equipment~~ • ~~Place wires or wire spikes on towers, buildings, or other facilities to discourage birds from perching and nesting on these structures~~ ~~Deterrents that may directly impact birds, nests, or habitat (therefore requiring consultation) could include, but are not limited to, the following:~~ • ~~Prior to the nesting season, remove vegetation from areas that would be directly disturbed by Proposed Project decontamination and dismantlement activities~~ • ~~Hire a U.S. Fish and Wildlife-permitted falconer to fly raptors in the area to deter birds from perching or nesting on structures~~ ~~If the deterrent method may directly impact birds, nests, or habitat, t~~The Applicant ~~and/~~or its contractor and the construction team shall consult with CSLC staff (or its contracted monitor) and California Department of Fish and Wildlife ~~and California Coastal~~					

Table 7-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring / Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	~~Commission~~ staff~~s~~ (if requested) to determine specific locations for the use of exclusionary or deterrent devices.					
BIO-3: Disturb Non-Listed Roosting or Breeding Bats	**MM BIO-3: Sensitive Bats Species.** Within ~~7~~ 14 days prior to dismantling and external demolition activities of the ~~o~~Onshore ~~s~~Site facilities, a qualified biologist with demonstrated expertise with bats shall conduct a pre-activity survey for roosting bats within Proposed Project structures. All Proposed Project structures with exterior openings shall be surveyed by a qualified bat biologist using radio telemetry and visual inspection, or other methods approved by the California Department of Fish and Wildlife (CDFW). The resume of the biologist and survey methodology shall be provided to the CDFW for concurrence prior to any Proposed Project activities, with a copy to California State Lands Commission (CSLC) and Department of the Navy (DoN) staff. If active maternity roosts are found, impacts to the occupied structure shall be delayed until the end of the breeding period for the species identified. If delay is infeasible, the bat biologist shall survey the surrounding area using radio telemetry or other methods approved by CDFW to locate nearby alternative maternity colony sites. If the bat biologist determines that there are alternative roost sites used by the maternity colony, and young are not present, then no further action is required. However, if there are no alternative maternity roosts near the site, substitute roosting habitat for the maternity	Onshore	Compliance and provide survey results to CSLC, DoN, and CDFW staffs	Prior to ~~decommissioning~~ Proposed Project activities	Applicant or contractor	Reduce impacts to bat species

Table 7-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring / Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	colony shall be provided on, or near, the terrestrial study area in consultation with CDFW and DoN staff prior to eviction of the colony. A copy of the survey, including how any impacts to the species were resolved, shall be submitted to CSLC, DoN, and CDFW staff within 30 days of completion.					
BIO-4: Modify Potential Onshore U.S./ Waters of the State	**MM BIO-4: Potential Waters of the U.S./State.** If the California Department of Fish and Wildlife (CDFW), California Coastal Commission, Regional Water Quality Control Board (RWQCB), or U.S. Army Corps of Engineers (USACE) determine that the concrete ditches onsite are waters of the state/U.S., the Applicant or its contractor shall obtain, and shall comply with all mitigation and conditions associated with, one or more of the following permits, as applicable: a CDFW Lake and Streambed Alteration Agreement; RWQCB Section 401 Water Quality Certification; or Section 404 USACE permit. Permit compliance shall be met through the purchase of in-lieu credits for non-vegetated streams at an approved mitigation bank, implementation of in-kind or out-of-kind restoration, or a combination of these actions. The mitigation replacement ratio shall be determined by the regulatory agencies during the permitting process. Evidence of compliance with agency requirements shall be provided to CSLC staff prior to ~~decommissioning~~ Proposed Project activities.	Onshore	Evidence of compliance with regulatory agencies to CSLC staff	Prior to ~~decommissioning~~ Proposed Project activities	Applicant or contractor	Reduce impacts to potential waters of the U.S./State

Table 7-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring / Reporting Action	Timing	Responsible Party	Effectiveness Criteria
BIO-6: Conflict with Adopted Conservation Plans	**Implement MM BIO-1a, MM BIO-1b, MM BIO-2a, MM BIO-2b, MM BIO-2c, MM BIO-2d, MM BIO-2e, MM BIO-2f, and MM BIO-4, and APM-4, APM-8, and APM-12 (provided above).**					
BIO-7: Contribute to the Degradation of Marine Habitats	**APM-17: Offshore Spill Response Plan.** As part of the Spill Prevention Control and Countermeasure Plan, the Applicant ~~and/~~or its contractor shall prepare an Offshore Spill Response Plan that shall, at a minimum, include: • Procedures and protocols to be used in the event of an offshore oil spill • Discussion of potential sources of hydrocarbons (limited to leakage or spillage of fuel or lubricants from onshore and from marine equipment used during dispositioning operations) • Description of marine spill scenarios and response procedures to be used in the event of an onshore or offshore oil or chemical spill • List of the spill response team members, including contact information and the notification process • Shipboard copies of the Plan and all necessary equipment to implement said Plan onboard The Applicant <u>or its contractor</u> shall submit the Plan to California State Lands Commission (CSLC) staff, for review and approval by CSLC staff, for review and approval in consultation with the Office of Spill Prevention and Response a minimum of 60 days prior to	Offshore	Offshore Spill Response Plan to CSLC staff in consultation with OSPR	Prior to ~~and during decommissioning~~ <u>commencement of offshore work</u> activities	Applicant ~~and/~~or contractor	Reduce impacts associated with marine degradation

Table 7-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring / Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	commencement of ~~conduit disposition work operations~~ CSLC Lease Offshore Activities.					
	Implement APM-1 and APM-12 (provided above)					
BIO-8: Risk of Oil Spill Mortality to Protected Marine Species	**Implement of APM-17 (provided above)**					
BIO-9: Release of H_2S Gas from Intake and Discharge Conduits	**MM BIO-9: Hydrogen Sulfide (H_2S) Gas Control Plan.** Prior to accessing any enclosed spaces within the conduits, a qualified H_2S inspector, capable of assessing the level of risk from H_2S build up, shall undertake an H_2S Gas Risk Assessment, which may include ~~conduct~~ an inspection to determine if H_2S gas occurs at sufficient levels to pose a danger of release and subsequent mortality of listed marine species. • If a desk-based Risk Assessment indicates a risk of H_2S build-up, an inspection shall be conducted. ~~the inspection confirms the presence of levels of H_2S gas sufficient to cause a risk to marine life in the area if released, the inspector shall develop and implement a H_2S Gas Control Plan as part of the detailed demolition planning. This H_2S Control Plan must allow for controlled safe removal/release of H_2S during the demolition activities.~~ • The Risk Assessment and any subsequent ~~P~~plan shall be provided for review to California State Lands Commission staff, California Coastal Commission staff, and other agencies as appropriate no less than	Offshore	Hydrogen Sulfide Gas Control Plan for review, or evidence of absence	Prior to removal of conduit components	Applicant or contractor	Reduce potential impacts associated with ~~H~~hydrogen ~~S~~sulfide ~~G~~gas

Table 7-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring / Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	60 days prior to any conduit decommissioning work.					
BIO-10: Seabed Disturbance, Dredging, and Debris Accumulation	**MM BIO-10: Anchoring Plan.** The Applicant or its contractor shall prepare an Anchoring Plan for the derrick barge and any other vessels requiring large or frequent anchoring. The Plan shall describe the offshore activities for which vessel anchoring is required, including anchoring arrangements, general procedures for deploying and recovering anchors, and identify the locations of any temporary laydown areas along with the process for avoiding hard substrate and sensitive marine areas (e.g., surfgrass). The Plan shall include: • The positioning of large anchors used to moor the derrick barge to locations that avoid damage to the seabed, surfgrass, and canopy kelp habitat from both the anchors and mooring chains. If alternative anchor sites with no habitat cannot be identified, consultation with U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) shall be required prior to finalization of the Plan • Anchor positions shown within a spatial accuracy sufficient to allow comprehensive survey mapping of benthic habitats, particularly surfgrass and canopy kelp habitats by qualified SCUBA divers prior to anchoring. Mapping shall include stipe density counts, precise areal coverage, and associated flora and fauna. Surveys shall include special attention towards identifying the presence of abalone at the site. All	Offshore	Provide Anchoring Plan for review and approval	Prior to removal of conduit components	Applicant or contractor	Reduce potential impacts associated with marine degradation

Table 7-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring / Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	abalone observed must be identified to species. • Locations and size of temporary laydown areas that avoid damage to the seabed, surfgrass, and canopy kelp habitat, and measures to address the positioning of materials. • Additional protective measures such as anchor deployment speeds (to avoid impacts to epifaunal fishes and invertebrates). • A statement that surveys shall be repeated within 1 month after anchors have been removed to demonstrate areas are not affected by anchor damage or to evaluate/quantify the area that was affected for purposes of determining mitigation. The Anchoring Plan shall be completed and submitted to USFWS, NMFS, and California State Lands Commission staffs for review and approval 60 days prior to start of offshore activities.					
	APM-9: Conduit Work Plan. The Applicant and/or its contractor shall prepare a Conduit Work Plan, which shall fully describe the nature, structure, and sequence of activities comprising the approach to offshore conduit decommissioning work, including anchor positioning, dredge footprint, and side-casting footprints in relation to seabed habitat descriptions. Seabed habitat descriptions should include identification of biotic (vegetation type, species accounts, etc.) and abiotic (nature of the sediment/benthos, etc.) habitat character. The Plan shall include	Offshore	Provide Conduit Work Plan for review and approval	Prior to removal of conduit components	Applicant or contractor	Reduce potential impacts associated with marine degradation

Table 7-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring / Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	details regarding the vessels used to transport conduit components and debris, and the means and methods for the work activities related to the dispositioning of the offshore conduit components. The Plan shall be submitted to California State Lands Commission staff for review and approval at least 60 days prior to start of offshore activities.					
	APM-15: Dredging Plan. To protect marine water quality during dredging and related offshore activities, the Applicant ~~and/~~or its contractor shall develop and implement a Dredging Plan prior to Proposed Project offshore activities. The Dredging Plan shall include protocols for dredging based on approved methods and standards set by the U.S. Army Corps of Engineers (USACE), California State Lands Commission (CSLC), California Coastal Commission (CCC), and the San Diego Regional Water Quality Control Board (RWQCB), including but not limited to: • Number and type of vessels required to conduct dredging • Information on the specific location of intended side-casting areas for each structure if using a long-reach excavator or similar method is intended. Including the predominant habitat type of the side-casting area (hard or soft sediment, presence of aquatic vegetation or other seabed habitat likely to be impacted) • Requirements to avoid areas of sensitive habitat; particularly rocky reefs and seagrass beds. If no seabed areas with	Offshore	Provide Dredging Plan for review and approval	Prior to removal of conduit components	Applicant or contractor	Reduce potential impacts associated with marine degradation

Table 7-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring / Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	suitable soft sediment habitat for side-casting exists within the proximity of the structures intended for removal, the contractor must consider diver-guided suction dredging methods that remove sediment to either the discharge conduits, or relocation of sediments to an appropriate side-casting location • Deployment of a floating boom and skirt around offshore and shoreline Proposed Project activities to prevent or minimize impacts to marine water quality • Appropriate methods for dealing with dredged material based on sediment sampling, testing, and analysis results The Applicant or its contractor shall submit the Dredging Plan to CSLC staff, for review and approval by CSLC staff in consultation with the USACE, CCC, and RWQCB, not less than 30 days prior to commencement of Proposed Project offshore work.					
	APM-16: Turbidity Monitoring. Turbidity monitoring shall be performed during Proposed Project offshore work to monitor any effects on water clarity in the immediate areas of the offshore work. Work shall be performed by a qualified water quality specialist who shall record turbidity from a suitable vantage point during each day of offshore dredging and decontamination and dismantlement. The Applicant ~~and/~~or its contractor shall send weekly electronic copies of the turbidity monitoring reports for review by California State Lands Commission and San Diego Regional Water Quality Control Board staffs.	Offshore	Provide monitoring reports for review	Prior to and during all offshore ~~decommissioning~~ work	Applicant or contractor	Reduce potential impacts associated with marine degradation

Table 7-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring / Reporting Action	Timing	Responsible Party	Effectiveness Criteria
BIO-11: Harassment of Marine Life	**MM BIO-11: Marine Mammal and Sea Turtle Mitigation and Monitoring Plan.** The Applicant or its contractor shall prepare a Marine Mammal and Sea Turtle Mitigation and Monitoring Plan. The purpose of the Plan is to ensure that no harassment of marine mammals or other marine life occurs during Proposed Project activities. The Plan, which may be a part of a National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS) consultation under the Marine Mammal Protection Act, shall include: • A description of the work activities including vessel size, activity types and locations, and Proposed Project timeframes • A risk analysis (likelihood and consequence) of noise effects to marine mammals and sea turtles based on the most recent activity plans • The qualifications, number, location, and roles/authority of dedicated marine wildlife observers (MMOs). A minimum of two MMOs, approved by California State Lands Commission (CSLC) and NMFS staffs, shall be placed on major support vessels • The distance, speed, and direction transiting vessels shall maintain when in proximity to a marine mammal or turtle, as follows: o Vessel operators shall make every effort to maintain a distance of at least 300 feet from sighted whales, and 150 feet or greater from sea turtles or smaller cetaceans whenever possible	Offshore	Provide Marine Mammal and Sea Turtle Mitigation and Monitoring Plan	Prior to ~~the~~ implementation of offshore work	Applicant or contractor	Reduce potential impacts to marine mammals and sea turtles

Table 7-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring / Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	o When small cetaceans are sighted while a vessel is underway (e.g., bow-riding), vessel operators shall attempt to remain parallel to the animal's course. When paralleling whales, vessels shall operate at a constant speed that is not faster than the whales' and shall avoid excessive speed or abrupt changes in direction until the cetacean has left the area. o Per NMFS recommendations, and when safety permits (i.e., excluding during poor sea and weather conditions, thereby ensuring safe vessel maneuverability under those special conditions), vessel speeds shall not exceed 11.5 miles per hour (10 knots) when mother/calf pairs, groups, or large assemblages of cetaceans (greater than five individuals) are observed near an underway vessel. A single cetacean at the surface may indicate the presence of submerged animals in the vicinity; therefore, prudent precautionary measures, such as decreasing speed and avoiding sudden changes in direction, should always be exercised. The vessel shall route around the animals, maintaining a minimum distance of 300 feet. Whales may surface in unpredictable locations or approach slowly moving vessels. When an animal is sighted in the vessel's path or in close proximity to a moving vessel and when safety permits, operators shall reduce speed and shift the engine to neutral. Vessel operators shall not engage the					

Table 7-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring / Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	engines until the animals are clear of the area. o Support vessels (i.e., barge tows) shall not cross directly in front of migrating whales, other threatened or endangered marine mammals, or sea turtles o Vessels shall not separate female whales from their calves or herd or drive whales. If a whale engages in evasive or defensive action, support vessels shall drop back until the animal moves out of the area. • Observation recording procedures and reporting requirements in the event of an observed impact to marine wildlife. Collisions with marine wildlife shall be reported promptly to the federal and state agencies listed below pursuant to each agency's reporting procedures. National Marine Fisheries Service Southwest Region Stranding Coordinator Long Beach, CA 90802 Phone: (562) 980-3230 or (562) 506-4315 (24-hour cell) California State Lands Commission Mineral Resources Management Division Long Beach, CA 90802 Phone: (562) 590-5201 • An acoustic monitoring strategy. If underwater sound pressure levels are thought to exceed limits established by NMFS, a marine acoustics specialist shall install acoustic monitoring devices before saw cutting occurs to monitor and establish					

Table 7-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring / Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	Level B behavioral harassment zones, which shall be enforced by qualified marine wildlife observers. The strategy shall also include the pausing of activities that generate sufficient noise to exceed limits established by NMFS while vulnerable marine organisms are in the established harassment zones. This mitigation is subject to NMFS and USFWS consultation. The plan shall be submittedt to CSLC staff a minimum of 30 days prior to the implementation of offshore work.					
BIO-12: Spread of Invasive and Non-Native Marine Species	**MM BIO-12: Invasive Non-Native Aquatic Species (NAS).** To prevent the introduction of NAS, all Proposed Project vessels shall: • Originate from Oceanside Harbor, the Ports of Long Beach/Los Angeles, Dana Point Harbor, or San Diego Bay and be continuously based out of Oceanside Harbor, the Ports of Long Beach/Los Angeles, Dana Point Harbor, or San Diego Bay since last dry docking or have underwater surfaces cleaned before entering southern California at vessel origination point and immediately prior to transiting to the Project site • Be managed consistent with California State Lands Commission (CSLC) Ballast Management Regulations regardless of vessel size. Biofouling Removal and Hull Husbandry Reporting Forms shall be submitted to CSLC staff • Proposed Project vessels shall be available for inspection by CSLC staff for compliance.	Offshore	Compliance	During offshore work	Applicant or contractor	Reduce potential impacts related to NAS

Table 7-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring / Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	Further, as part of the Project kickoff meeting, a qualified marine biologist, approved by CSLC staff, shall provide information to all Project personnel about the spread of NAS in California waters and the programs that will be implemented to minimize this hazard (CSLC Ballast Water Management Program and Biofouling Removal and Hull Husbandry Reporting).					
Cultural and Paleontological Resources						
CR-2: Change Significance of Previously Unidentified Historical or Unique Archaeological Resources	**MM CR/TCR-2a: Archaeological and Tribal Monitoring.** A California State Lands Commission (CSLC) staff-approved archaeological monitor that meets the Secretary of the Interior's Professional Qualifications Standards (as defined in 36 Code of Federal Regulations Part 61), and is certified in hazardous materials response, shall be present for all ground-disturbing activities that may exceed 3 feet in depth in onshore areas. A Tribal monitor that is culturally affiliated with the area may also be present during these activities. The Tribal monitor shall also have certification in hazardous materials response, to be provided by the Applicant or its contractor, if working in or near radiologically contaminated structures, remains of structures, or soils. The archaeological monitor shall complete daily monitoring forms and prepare a summary monitoring report to be submitted weekly to CSLC staff. The archaeological and Tribal monitors have the authority to increase or decrease the monitoring effort should the	Onshore	Compliance	During ~~decommissioning~~ Proposed Project activities	Applicant or contractor	Reduce potential impacts to cultural resources

Table 7-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring / Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	monitoring results indicate that a change is warranted.					
	MM CR/TCR-2b: Unanticipated Cultural/Tribal Resources. If potentially significant archaeological or Tribal cultural resources are discovered during demolition activities, work within 100 feet of the find shall be temporarily suspended or redirected away from the discovery. The Applicant or its contractor shall notify California State Land Commission (CSLC) staff and any local, state, or federal agency with approval or permitting authority over the Project that has requested/required notification within 48 hours of discovery, consistent with guidelines for Tribal involvement stated in the CSLC Tribal Policy (www.slc.ca.gov/About/Tribal.html). The Applicant or its contractor shall retain a CSLC-approved archaeologist and request a culturally affiliated Tribal representative to evaluate the nature and significance of the discovery. In addition, the following shall apply: • Impacts to previously unknown significant archaeological or Tribal cultural resources shall be avoided through preservation in place if feasible • If the lead archaeologist and culturally affiliated Tribal representative believe that damaging effects to archaeological or Tribal cultural resources will be avoided or minimized, then work in the area may resume. Damaging effects shall be avoided or minimized following the measures in Public Resources Code section 21084.3,	Onshore	Compliance and provide Treatment Plan, if needed	During ~~decommissioning~~ Proposed Project activities	Applicant or contractor	Reduce potential impacts to cultural resources

Table 7-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring / Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	subdivision (b), unless other measures that would be as or more effective are mutually agreed to by the lead archaeologist and culturally affiliated Tribal representative • If resources cannot be avoided, a Treatment Plan developed by the archaeologist and culturally affiliated Tribal representative shall be submitted to CSLC staff for review and approval prior to further disturbance of the area. The plan shall: o State requirements for professional qualifications of all cultural resources specialists and Tribal cultural resource workers o Identify appropriate methods of resource recording, artifact cataloguing, and analyses o Determine appropriate levels of recovery or stabilization of resources o Provide documentation of a curatorial facility or museum that will be responsible for the permanent preservation of any unique or sensitive cultural materials resulting from site recovery and stabilization efforts • If the discovery is made in radiologically-contaminated Project areas, the archaeologist, Tribal representative, or other Tribal participant(s) shall follow safety protocols not less than those currently established by the U.S. Nuclear Regulatory Commission and Southern California Edison's Requirements for Site Access and Access to Protected/ Restricted Radiologically Controlled Areas, which					

Table 7-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring / Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	include: (1) authorized searches; (2) processing and training requirements; (3) radiation protection; and (4) maintenance of a safety-conscious work environment.					
	MM CR/TCR-2c: Cultural Resource Identification during Offshore Geophysical Surveys. The Applicant or its contractor shall ensure that a qualified maritime archaeologist that meets Secretary of the Interior Professional Qualifications Standards defined in 36 Code of Federal Regulations Part 61, approved by California State Lands Commission (CSLC) staff, participates in the development and implementation of the geophysical surveys conducted to develop the Anchoring and Dredging Plans. The archaeologist shall identify any cultural resources found during the surveys and prepare a summary report to be submitted to CSLC staff. Title to all abandoned shipwrecks, archaeological sites, and historic or cultural resources on or in the tide and submerged lands of California is vested in the State and under the jurisdiction of the CSLC. The final disposition of archaeological, historical, and paleontological resources recovered on State lands under the jurisdiction of the CSLC must be approved by the Commission.	Offshore	Compliance	Prior to and during ~~decommissioning~~ Proposed Project activities	Applicant or contractor	Reduce potential impacts to cultural resources
	APM-10: Cultural Resources Protection. To ensure the Proposed Project does not impact cultural resources, all ground disturbing activities shall be conducted within the ~~existing disturbed~~historically excavated area footprint of the site and shall not encroach on	Onshore and Offshore	Compliance	During ~~decommissioning~~ Proposed Project activities	Applicant or contractor	Reduce potential impacts to cultural resources

Table 7-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring / Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	the adjacent surrounding undisturbed areas. The archeological and/or Tribal monitor shall halt work if archaeological materials (e.g., shell, wood, bone, or stone artifacts) are found or suspected during Proposed Project activities, or the Proposed Project footprint is altered in the area of discovery. ~~The following parties shall be notified within 24 hours of the discovery:~~ ~~Onshore: Marine Corps Base Camp Pendleton (MCBCP) Environmental Science, Cultural Resources Management Branch~~ ~~Offshore: California State Lands Commission Division of Environmental Planning and Management (CSLC) staff~~ ~~Proposed Project work at the discovery site shall not proceed until the MCBCP Archaeologist (onshore) or CSLC staff or its approved monitor (offshore) has evaluated the find and gives permission to resume Proposed Project activities.~~					
CR-3: Disturb Unidentified Human Remains	**APM-11: Appropriate Treatment of Human Remains.** In accordance with state law (Health & Saf. Code, § 7050.5; Pub. Resources Code, § 5097.98), if human remains are found, all ground disturbing activities shall halt within 165 feet (50 meters) of the discovery. The County Coroner shall be notified within 24 hours of the discovery. No further excavation or disturbance of the discovery or any nearby area reasonably suspected to overlie potential remains shall occur until the County Coroner has determined whether the remains are subject to his or her authority. The County Coroner	Onshore and Offshore	Compliance	During ~~decommissioning~~ Proposed Project activities	Applicant or contractor	Reduce potential impacts to cultural resources

Table 7-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring / Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	must make this determination within 2 working days of notification of the discovery (pursuant to Health & Saf. Code, § 7050.5, subd. (b)). If the County Coroner determines that the remains do not require an assessment of cause of death and that the remains are, or are believed to be Native American, the Coroner must notify the Native American Heritage Commission (NAHC) by telephone within 24 hours, which must in turn immediately notify those persons it believes to be the Most Likely Descendant (MLD) of the deceased Native American. The MLD shall complete its inspection and make recommendations within 48 hours of being granted access to the site. The MLD may recommend means for treatment or disposition, with appropriate dignity, of the human remains and any associated grave goods. CSLC staff shall discuss and confer with the MLD regarding their recommendations (pursuant to Pub. Resources Code, § 5097.98, subds. (b) and (c)).					
CR-4: Destruction of Unique Paleontological Resources	**MM CR-4a: Paleontological Monitoring.** A qualified paleontologist must be present to monitor all ground disturbing activities within the onshore area. The paleontological monitor shall: • Have certification in Hazardous Materials Response procedures if working in or near radiologically contaminated structures, remains of structures, or soils • Follow safety protocols established by the Southern California Edison's Requirements	Onshore	Compliance	During ~~decommissioning~~ Proposed Project activities	Applicant or contractor	Reduce potential impacts to paleontological resources

Table 7-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring / Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	for Site Access and Access to Protected/Restricted-Radiologically Controlled Areas, which includes: (1) authorized searches; (2) processing and training requirements; (3) radiation protection; and (4) maintenance of a safety-conscious work environment • Fill out daily monitoring forms and prepare a weekly summary monitoring report • Have the authority to increase or decrease the monitoring effort should the monitoring results indicate that a change is warranted					
	MM CR-4b: Unanticipated Paleontological Resources. In the event unanticipated paleontological resources or unique geologic resources are encountered during demolition activities, work within 100 feet of the find shall be temporarily suspended or redirected away from the discovery until the Applicant retains a qualified paleontologist, who has demonstrated experience in carrying paleontological projects to completion, to evaluate the nature and significance of the discovery. If the resource cannot be avoided, the paleontologist shall develop and implement a Paleontological Resources Management Plan for the Proposed Project area that includes specimen identification to the lowest taxonomic level possible, analysis, curation, and the preparation of a final report. The plan shall be submitted to California State Lands Commission staff for review and approval prior to further disturbance of the area.	Onshore	Compliance, and provide a Paleontological Resources Management Plan, if needed, for review and approval	During ~~decommissioning~~ Proposed Project activities	Applicant or contractor	Reduce potential impacts to cultural resources

Table 7-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring / Reporting Action	Timing	Responsible Party	Effectiveness Criteria
Cultural Resources - Tribal						
TCR-2: Change Significance of Previously Unidentified Tribal Cultural Resources	**Implement MM CR/TCR-2a, MM CR/TCR-2b, MM CR/TCR-2c, and APM-10 and APM-11 (provided above)**					
TCR-3: Disturb Unidentified Tribal Human Remains	**Implement APM-11 (provided above)**					
Geology, Soils, and Coastal Processes						
GEO/ CP-2: Construction Triggered Erosion	**Implement APM-12 (provided above)**					
Hydrology and Water Quality						
WQ-1: Violation of Water Quality Standards or Waste Discharge Requirements, or Generation of Substantial Additional Sources of Polluted Runoff	**Implement APM-1, APM-2, APM-12, APM-13, and APM-14 (provided above)**					
WQ-2: Groundwater Characterization and Discharge	**Implement MM HAZ-6 (above)**					
WQ-4: Erosion or Siltation due to Altered Drainage Patterns	**MM WQ-4: ~~Interim Erosion Control~~Onshore Site Stablization Plan.** The Applicant ~~and/~~or its contractor shall prepare and implement an ~~interim~~ Onshore Site Stabilization Plan to cover the Onshore Site conditions following Proposed Project completion. This Plan shall	Onshore	Provide the Onshore Site Stabilization Plan ~~an interim erosion control~~	~~During decommissioning activities~~At the conclusion of Proposed Project activities until the	Applicant ~~and/~~or contractor	Reduce potential impacts due to erosion

Table 7-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring / Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	include erosion-control, ~~plan, including~~ monitoring, and adaptive management measures, to prevent Proposed Project-induced fugitive dust and erosion that may occur ~~subsequent to the initial decommissioning activities~~after Proposed Project completion. Site stabilization would be accomplished either through the use of non-vegetative cover such as gravel, or vegetative cover through the application of a native erosion control mix. During preparation of the plan, the Applicant or its contractor shall consult with California State Lands Commission (CSLC), California Coastal Commission, and the San Diego Regional Water Quality Control Board~~, and Department of the Navy staffs~~, and a final copy provided to CSLC staff for review and approval a minimum of 60 days prior to start of ~~decommissioning~~ Proposed Project ground-disturbing activities. This Plan shall remain in effect until the beginning of Future Activities.		~~plan~~ for review and approval	start of Future Activities		
	Implement APM-12 (provided above)					
WQ-5: Flooding due to Altered Drainage Patterns or Increased Surface Runoff	**MM WQ-5: Walkway Flood Protection Plan.** In consultation with the California Coastal Commission (CCC)~~,~~ and the San Diego Regional Water Quality Control Board (RWQCB),~~ and Department of the Navy (DoN)~~, the Applicant ~~and/~~or its contractor shall prepare an alternate drainage plan that avoids discharging surface waters directly to the surface of the public access walkway. This may be accomplished by discharging under the walkway through culverts or other methods acceptable to the CCC~~ and DoN~~.	Onshore	Provide an interim erosion-control plan for review and approval	Prior to ~~decommissioning~~ Proposed Project activities	Applicant ~~and/~~or contractor	Reduce potential impacts due to water discharge

Table 7-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring / Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	Any discharge beneath the walkway shall be engineered to avoid damage to the walkway subgrade. The Applicant or its contractor shall submit the Plan to California State Lands Commission staff for review and approval in consultation with the CCC~~,~~ and RWQCB~~, and DoN,~~ a minimum of 60 days prior to start of ~~decommissioning~~ Proposed Project activities.					
WQ-6: Increased Ocean Turbidity and Marine Debris	**Implement APM-1, APM-15, and APM-16 (provided above)**					
WQ-7: Degraded Marine Water Quality from Oil or Chemical Spills	**Implement APM-17 (provided at the end of this MMP)**					
Land Use and Planning						
LU-2: Disrupt, Displace, or Divide Existing or Approved Land Uses	**MM LU-2a: Deconstruction Liaison.** At least 1 month prior to the start of any deconstruction activities, and thereafter for the duration of the Project, the Applicant or its contractor shall appoint a Deconstruction Liaison and provide a toll-free general number and the name and contact information for the liaison (or liaisons) for all Marine Corps Base Camp Pendleton (MCBCP) operations and residents within 5 miles of the Project site by U.S. Postal Service mail. The identified deconstruction liaison(s) shall: • Act as a point of contact and interface between MCBCP personnel and local residents and the San Onofre Nuclear Generating Station deconstruction crews • Be available both in person and by phone, as necessary, for at least 1 month prior to	Onshore	Provide summary documentation of all complaints, comments, and concerns	Prior to and during ~~decommissioning~~ Proposed Project activities	Applicant ~~and/~~or contractor	Reduce potential impacts related to construction

Table 7-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring / Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	the start of deconstruction, and for 6 months following the completion of the Project • Respond to all Project-related questions and concerns within a 72-hour period when contact information is provided In addition, the Applicant or its contractor shall provide the California State Lands Commission and Department of the Navy staffs with summary documentation of all complaints, comments, and concerns communicated to the liaison(s) every 3 months for the duration of deconstruction activities, and 2 times (once every 3 months) for the 6-month period following the completion of Project activities. The compliance documentation shall include the name and address of the person contacting the liaison(s), the date of contact, and what actions were taken by the liaison(s) to rectify or address the complaints, comments, or concerns expressed.					
	MM LU-2b: Advance Notification of Deconstruction. The Applicant or its contractor shall give at least 30 days advanced notice of the start of any deconstruction activities to Marine Corps Base Camp Pendleton operations and residents within 5 miles of the Project site by U.S. Postal Service mail. The notification shall include the location, types, and expected duration of each deconstruction activity scheduled for the first 3 months following publication of the notification. The notification shall also include the toll-free general phone	Onshore	Compliance	Prior to and during Proposed Project ~~decommissioning~~ activities	Applicant ~~and/~~or contractor	Reduce potential impacts related to construction

Table 7-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring / Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	number and contact information for the deconstruction liaison(s), as well as an internet website address where additional information related to deconstruction activities can be found.					
	MM LU-2c: Quarterly Deconstruction Updates. Following distribution of the advance notification of deconstruction, the Applicant or its contractor shall provide Marine Corps Base Camp Pendleton operations and residents within 5 miles of the Project site with updates to all current and scheduled deconstruction activities on the Project's internet website and by U.S. Postal Service mail. The updates shall be provided every quarter for the duration of deconstruction activities. The updates shall continuously include the location, types, and expected duration of each deconstruction activity scheduled for the 3-month period following each update's publication date. The updates shall also include a toll-free number and the name and phone number of the deconstruction liaison(s) to respond to all deconstruction-related questions and concerns.	Onshore	Compliance	Prior to and during ~~decommissioning~~ Proposed Project activities	Applicant ~~and/~~or contractor	Reduce potential impacts related to construction
Recreation and Public Access						
REC-1: Reduction of Public Access to Recreational Facilities	**MM REC-1a: Public Notification.** In areas where decommissioning activities would impact recreational facilities, the Applicant ~~and/~~or its contractor shall place warning signs, and if needed, implement detour routes, 24 hours prior to implementation of those activities.	Onshore	Compliance	Prior to and during ~~decommissioning~~ Proposed Project activities	Applicant ~~and/~~or contractor	Reduce potential impacts related to public access

Table 7-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring / Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	In addition, the Applicant or its contractor shall maintain for the duration of Proposed Project activities a public website that provides Proposed Project-related information including but not necessarily limited to offshore work schedules, Traffic Plans, Local Notices to Mariners, and any anticipated closures to bicycle and pedestrian lanes, public accessways, or beaches.					
	MM REC-1b: Public Access Plan. The Applicant ~~and/~~or its contractor shall develop a Public Access Plan to ensure public access around the Proposed Project area is not significantly affected. The Plan shall avoid: • Any long-term increase in traffic that would conflict with adopted policies, plans, or programs supporting alternative transportation; or obstruct current access to and around the Proposed Project area~~.~~ • Restrictions on roads used to access San Onofre State Beach both north and south of the Proposed Project area that would result in a full road closure or substantial disruptions~~.~~ The Plan would require, but not be limited to the following: • Implementation of the Plan by trained personnel • Appropriate posting of traffic and safety signs • Haul truck trips to be concentrated during off-peak hours during project construction to the extent practicable. Trucks trips shall be	Onshore	Provide Public Access Plan to CSLC staff for review and approval	Prior to and during ~~decommissioning~~ Proposed Project activities	Applicant ~~and/~~or contractor	Reduce potential impacts related to public access

Table 7-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring / Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	scheduled to avoid weekends and holidays to maximum extent possible. The plan shall be submitted to California State Lands Commission staff for review and approval a minimum of 30 days prior to ~~decommissioning~~ Proposed Project activities.					
	APM-18: Notification to Local Mariners. The Applicant ~~and/~~or its contractor shall be responsible for Local Notices to Mariners (as per U.S. Coast Guard requirements) and compliance with all navigational protocols of the U.S. Department of the Navy, including vessel and diving restrictions in the Proposed Project's offshore area. The notifications shall include the location of moored vessels, likely transit routes, and approximate dates, durations, and working hours. The notices shall be submitted prior to start of any offshore activities and electronic copies posted for review by California State Lands Commission and California Coastal Commission staffs.	Offshore	Compliance	Prior to offshore ~~decommissioning~~ Proposed Project activities	Applicant or contractor	Reduce potential impacts to recreation and public access
REC-3: Create Hazards for Recreationists	**Implement MM REC-1a and APM-18 (provided above)**					
Transportation and Traffic						
TR-1: Reduce Local Transportation and Circulation	**Implement MM REC-1b (provided above)**					
	APM-19: Emergency Services Access. The Applicant or its contractor shall coordinate with U.S. Marine Corps Camp Pendleton, San Diego County, and the City of San Clemente	Onshore	Compliance	Prior to and during ~~decommissioning~~	Applicant or contractor	Reduce potential impacts to

Table 7-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring / Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	prior to road/lane closures to ensure that Proposed Project activities and associated road and lane closures would not significantly affect emergency response vehicles.			Proposed Project activities		traffic and transportation
	APM-20: Oversize/Overweight Loads. Prior to the first transport of an oversize/overweight load, the Applicant ~~and/~~or its contractor shall coordinate with the California Department of Parks and Recreation to establish protocols to ensure that equipment, components, and materials, including heavy haul loads, being transported to/from the site as part of the Proposed Project via Basilone Road (Old Pacific Highway) and across associated bridges (San Onofre Creek and Railroad Overhead) would not exceed established limitations or safe operating conditions.	Onshore	Compliance	Prior to and during Proposed Project ~~decommissioning~~ activities	Applicant or contractor	Reduce potential impacts to traffic and transportation
TR-2: Reduce Pedestrian and Bicycle Rider Safety	**Implement MM REC-1a (provided above)**					
	APM-21: Pedestrian and Bicycle Access and Safety. To minimize impacts associated with temporary access to local sidewalks or other pedestrian or bicyclist rights-of-way, the Applicant or its contractor shall coordinate with the California Department of Parks and Recreation to ensure that appropriate steps are taken to ensure continued pedestrian and bicyclist access and safety. Steps may include providing alternative access paths, signage, and advance notification.	Onshore	Compliance	Prior to and during ~~decommissioning~~ Proposed Project activities	Applicant or contractor	Reduce potential impacts to traffic and transportation
TR-5: Reduce Marine Vessel Safety	**APM-22: Private Aids to Navigation.** If required, the Applicant ~~and/~~or its contractor shall obtain or update a permit from the U.S. Coast Guard for Private Aids to Navigation	Onshore	Compliance	Prior to and during ~~decommissioning~~ offshore activities	Applicant or contractor	Reduce potential impacts to

Table 7-1. Mitigation Monitoring Program

Potential Impact	Mitigation Measure (MM)	Location	Monitoring / Reporting Action	Timing	Responsible Party	Effectiveness Criteria
	prior to the start of offshore activities. The permit shall include any buoys or other markers used as part of the Proposed Project and appropriate methods to install and maintain said markers.					traffic and transportation
	~~Also,~~ implement APM-9, APM-15, and APM-18 (~~see~~provided above)					

8.0 OTHER COMMISSION CONSIDERATIONS

In addition to the environmental review required pursuant to the California Environmental Quality Act (CEQA), a public agency may consider other information and policies in its decision-making process. This section presents information relevant to the California State Lands Commission's (CSLC's) consideration of the application by Southern California Edison (SCE or Applicant) for a lease for the Proposed Project. The considerations included below address:

- Climate Change and Sea-Level Rise
- Commercial Fishing
- Environmental Justice
- State Tide and Submerged Lands Possessing Significant Environmental Values

Other considerations may be addressed in the staff report presented at the time of the CSLC's consideration of the lease.

8.1 CLIMATE CHANGE AND SEA-LEVEL RISE CONSIDERATIONS

8.1.1 Environmental Setting

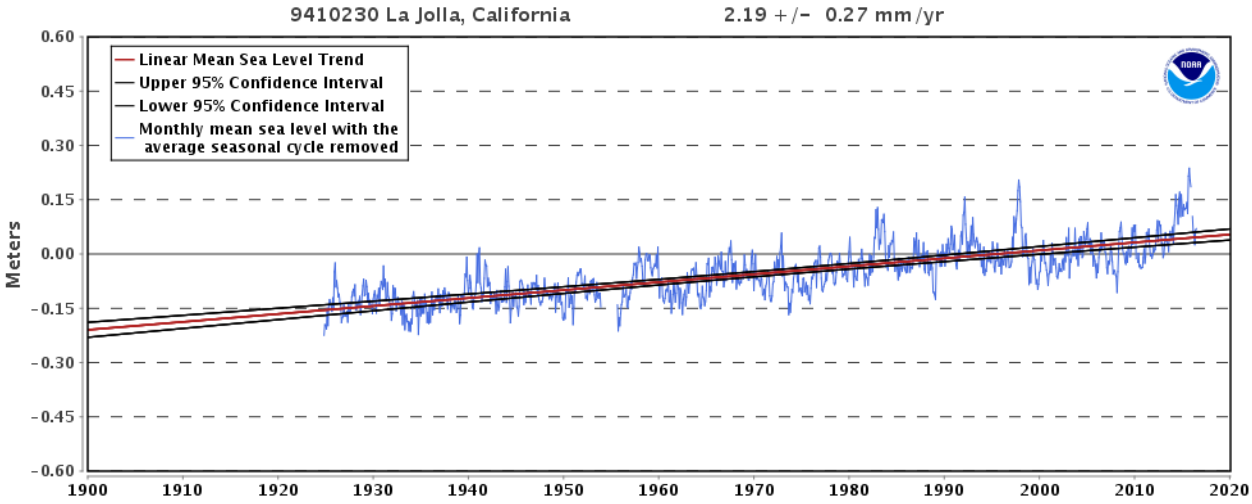
Climate change impacts, including sea-level rise, are already being felt in our oceans and along the California coast. Climate change and sea-level rise accelerate and exacerbate natural coastal processes, such as intensity and frequency of storms, erosion and sediment transport, and currents, wave action, and ocean chemistry. Sea-level rise is driven by the melting of polar ice caps and land ice, as well as thermal expansion of sea water. Accelerating rates of sea-level rise are attributed to increasing global temperatures due to climate change. Along with higher sea levels, higher intensity and more frequent winter storms due to climate change will further impact coastal areas. The combination of these conditions will likely result in increased wave run up, storm surge, and flooding in coastal and near coastal areas. In rivers and tidally-influenced waterways, more frequent and powerful storms can result in increased flooding conditions and damage from storm created debris. Climate change and sea-level rise will also affect coastal and riverine areas by changing erosion and sedimentation rates. Beaches, coastal landscapes, and near-coastal riverine areas exposed to increased wave force, run up, and total water levels could potentially erode more quickly than before. However, rivers and creeks are also predicted to experience flashier sedimentation pulse events from strong winter storms, punctuated by periods of drought. Therefore, depending on precipitation patterns, sediment deposition and accretion may accelerate along some shorelines and coasts.

Governor Brown's Executive Order B-30-15 instructed all State agencies to take climate change into account in their planning and investment decisions and to give priority to actions that build climate preparedness. The following discussion of climate change and sea-level rise is intended to provide the local/regional overview and context that the

Commission staff considered pursuant to this Executive Order. Additionally, it will facilitate the Commission's consideration of the Proposed Project.

Long-term changes in the elevation of sea level relative to the land may occur due to two independent factors: (1) global warming induced changes in sea level; and (2) local changes in the elevation of the land, resulting from subsidence or uplift. The ocean level has never remained constant over geologic time scales, but has risen and fallen relative to the land surface. A trendline analysis of yearly mean sea level (MSL) data recorded at La Jolla from 1924 to 2015 indicates that the upward trend in MSL is approximately 0.0072 feet per year, as shown in Figure 8.1-1 (National Oceanic and Atmospheric Administration [NOAA] 2014). According to the Intergovernmental Panel on Climate Change (IPCC), global average sea levels have risen approximately 0.6 feet over the last century, and are predicted to continue rising another 0.7 feet to 1.4 feet over the next century (IPCC 2007). In a 2009 study performed by the Pacific Institute on behalf of the California State Coastal Conservancy, scientific data gathered from 1980 to 1999 suggests that global sea-level rise has outpaced the IPCC predictions (Rahmstorf 2007). Potential effects from an acceleration of sea-level rise on coastal environments, such as erosion, net loss of shorefront, increased wetland inundation, and storm surge have the potential to displace coastal populations, threaten infrastructure, intensify coastal flooding, and ultimately lead to loss of recreation areas, public access to beaches, and private and public property.

Figure 8.1-1. Recent MSL Trend (La Jolla)



Source: NOAA 2014.

Given the potential for substantial effects that sea-level rise could have on coastal environments, federal and state agencies have prepared guidance for incorporating sea-level rise into the planning and design of projects. The California Coastal Commission released their sea-level rise policy guidance document in August 2015, which uses the 2012 National Research Council report as the best available projections of regional sea-level rise in California. The document is intended to provide guidance on how to address

sea-level rise in new and updated Local Coastal Programs and Coastal Development Permits (CDPs) according to the policies of the California Coastal Act. The full range of sea-level rise projections from the ~~NRC~~National Research Council report is provided below in Table 8.1-1.

Table 8.1-1. Sea-Level Rise Projections for California[1]

Time Period	South of Cape Mendocino
by 2030	2 to 12 inches (4 to 30 centimeters)
by 2050	5 to 24 inches (12 to 61 centimeters)
by 2100	17 to 66 inches (42 to 167 centimeters)

Source: National Research Council 2012 – Table 5.3 (LA values).
Note: [1] Sea-level rise values relative to year 2000 water level.

Compared to year 2000 levels, the Southern California region could see up to 1 foot of sea-level rise by 2030, 2 feet by 2050, and possibly over 5 feet by 2100. The range of sea-level rise projections reflects uncertainties in future greenhouse gas (GHG) emissions, future changes in the rate of ice sheet melt, and uncertainties related to the data. The low end of the range is based on the lowest IPCC 4th Assessment Report (AR4) future carbon dioxide (CO2) emissions scenario (B1), and the high end is based on the highest IPCC AR4 emissions scenario (A1FI) (2007). Again, given current GHG emission levels and projections of future ice sheet loss, the lowest range of the sea-level rise projections likely underrepresents future sea-level rise (Rahmstorf et al. 2012). The high end of the range is based on high fossil fuel usage, and the low end of the range is a change in lifestyle resulting in a lower mean sea-level rise scenario.

The ~~NRC~~National Research Council report did not, however, tie these projections to specific emission scenarios. The IPCC adopted a set of emissions scenarios known as representative concentration pathways (RCPs). These are a set of four future pathways, named for the associated radiative forcing level (the globally averaged heat-trapping capacity of the atmosphere measured in watts/square meter) in 2100 relative to pre-industrial values: RCP 8.5, RCP 6.0, RCP 4.5, and RCP 2.6. RCP 8.5 is consistent with a future in which there are no significant global efforts to limit or reduce emissions, while RCP 2.6 is a stringent emissions-reduction scenario and assumes that global GHG emissions will be significantly curtailed. Under the RCP 2.6 scenario, global CO2 emissions decline by about 70 percent between 2015 and 2050, to zero by 2080, and below zero thereafter.

RCP 2.6 most-closely corresponds to the aspirational goals of the United Nations Framework Convention on Climate Change's 2015 Paris Agreement, which calls for limiting global mean warming to less than 2 degrees Celsius (°C) and achieving net-zero GHG emissions in the second half of this century. This pathway would be very challenging to achieve, and most simulations of such stringent targets require widespread deployment of nascent carbon-negative technologies, such as sustainable bioenergy coupled to

carbon capture and storage, or direct air capture of CO2. As such, RCP 2.6 emission pathways will likely not be met.

Three of these RCPs were used to predict sea-level rise in the Ocean Protection Council's newest sea-level rise analysis, State of California Sea-Level Rise Guidance: 2018 Update (OPC 2018). These pathways are shown in Table 8.1-2. The table does not have RCP breakdowns for 2030 and 2050 because changes in emission scenarios were found to be minor prior to 2050. However, after 2050, the projections increasingly depend on GHG emissions. Table 8.1-2 also includes a newly developed extreme sea-level rise scenario, H++. This is an unknown-probability, high-consequence scenario that is expected to occur if high rates of Antarctic ice loss develop in the last half of this century.

Table 8.1-2. Projected Sea-Level Rise for Tide Gauge Locations (La Jolla)[1]

Year/Percentile	Feet above 1991–2009 Mean			
	Median	**Likely Range**	**1-in-20 Chance**	**1-in-200 Chance**
	50% Probability SLR Meets or Exceeds …	66% Probability SLR Meets or Exceeds …	5% Probability SLR Meets or Exceeds …	0.5% Probability SLR Meets or Exceeds …
2030	0.5	0.4–0.6	0.7	0.9
2050	0.9	0.7–1.2	1.4	2.0
2100 (RCP 2.6)	1.7	1.1–2.5	3.3	5.8
2100 (RCP 4.5)[2]	2.0	1.3–2.8	3.6	6.0
2100 (RCP 8.5)	2.6	1.8–3.6	4.6	7.1
2100 (H++)	10.2			
2150 (RCP 2.6)	2.5	1.5–3.9	5.7	11.1
2150 (RCP 4.5)[2]	3.1	1.9–4.8	6.5	11.8
2150 (RCP 8.5)	4.3	3.0–6.1	7.9	13.3
2150 (H++)	22			

Source: Griggs et al. 2017; OPC 2018.
Acronym: SLR = sea-level rise.
Notes:
[1] Projections are based on the methodology of Kopp et al. (2014) with the exception of the H++ scenario. The "likely range" is consistent with the terms used by the IPCC meaning that it has about a 2-in-3 chance of containing the correct value. All values are with respect to a 1991–2009 baseline. The H++ scenario is a single scenario, not a probabilistic projection, and does not have an associated distribution in the same sense as the other projections; it is presented in the same column for ease of comparison.
[2] Projected sea-level rise for RPC 4.5 can be found in Griggs et al. 2017, which is the science update used to inform the OPC 2018 guidance. The OPC 2018 guidance focuses on high and low sea-level rise scenarios (RPC 2.5 and 8.5); thus, RPC 4.5 was not included.

8.1.2 Environmental Considerations

Impact SLR-1: Contribution to Sea-Level Rise Effects.

The Proposed Project could exacerbate adverse effects on beach width or coastal sediment properties expected from rising sea levels **(Less than Significant).**

While the CCC sea-level rise policy guidance (CCC 2015b) is advisory, the CCC encourages projects to be consistent with the guidance. With respect to the Proposed Project, the guidance is most relevant for addressing sea-level rise in CDPs. The guidance intends to ensure that projects consider sea-level rise in their planning, design, and engineering throughout the life of the project and that projects pursue alternatives that minimize risks to the project and minimize risks to coastal resources.

It is not expected that sea-level rise would have any direct impacts on the conduit modifications or ending water discharges through the conduit. However, secondary impacts are more complex. Beaches are expected to narrow as a result of sea-level rise (CCC 2015b). Separately, loss of coastal sediment can theoretically cause a loss of beach width, but in the case of the Proposed Project, no measurable changes to beach widths are expected. While these two forces mostly influence beach widths independently, there may be some minor interaction. As such, any changes to coastal sediment properties resulting from sea-level rise are not connected to and are irrelevant to the negligible changes resulting from the Proposed Project.

In recent years, the CCC has required applicants for CDPs to offset any sediment their project entraps or otherwise removes from the available coastal sediment supply. In a similar way, the CCC often requires a monetary fee for any lost beach area that would otherwise be available for public recreation. If the Proposed Project reduces the volume of sediment in the littoral system, an associated loss of beach area can be calculated, which then can be converted into a recreation fee for use by the CCC.

8.1.3 Future Activities

The SONGS Decommissioning Plan Future Activities are expected to have no impact on future sea-level rise. Future Activities in combination with sea-level rise are expected to have some long-term changes to coastal processes, as discussed in Section 4.7.7, *Geology, Soils, and Coastal Processes – Future Activities*.

8.2 COMMERCIAL FISHING

8.2.1 Environmental Setting

Commercial fishing is an important part of social and economic activities in southern California. Commercial fishing along the California coast uses several gear types that target a wide variety of fish and invertebrate species. The most common commercial gear types include trawls, trolling, longlines, and gillnets. The following sections describe commercial fishing in the vicinity of the Proposed Project area. Information for commercial fisheries was taken from the California Department of Fish and Wildlife (CDFW) California Fishery Information System that maintains data on where fish are caught and landed. Information is provided below for commercial catch data for blocks in the vicinity of the

Proposed Project area, including nearshore and adjacent blocks (Figure 8.2-1) from 2012 through 2016.

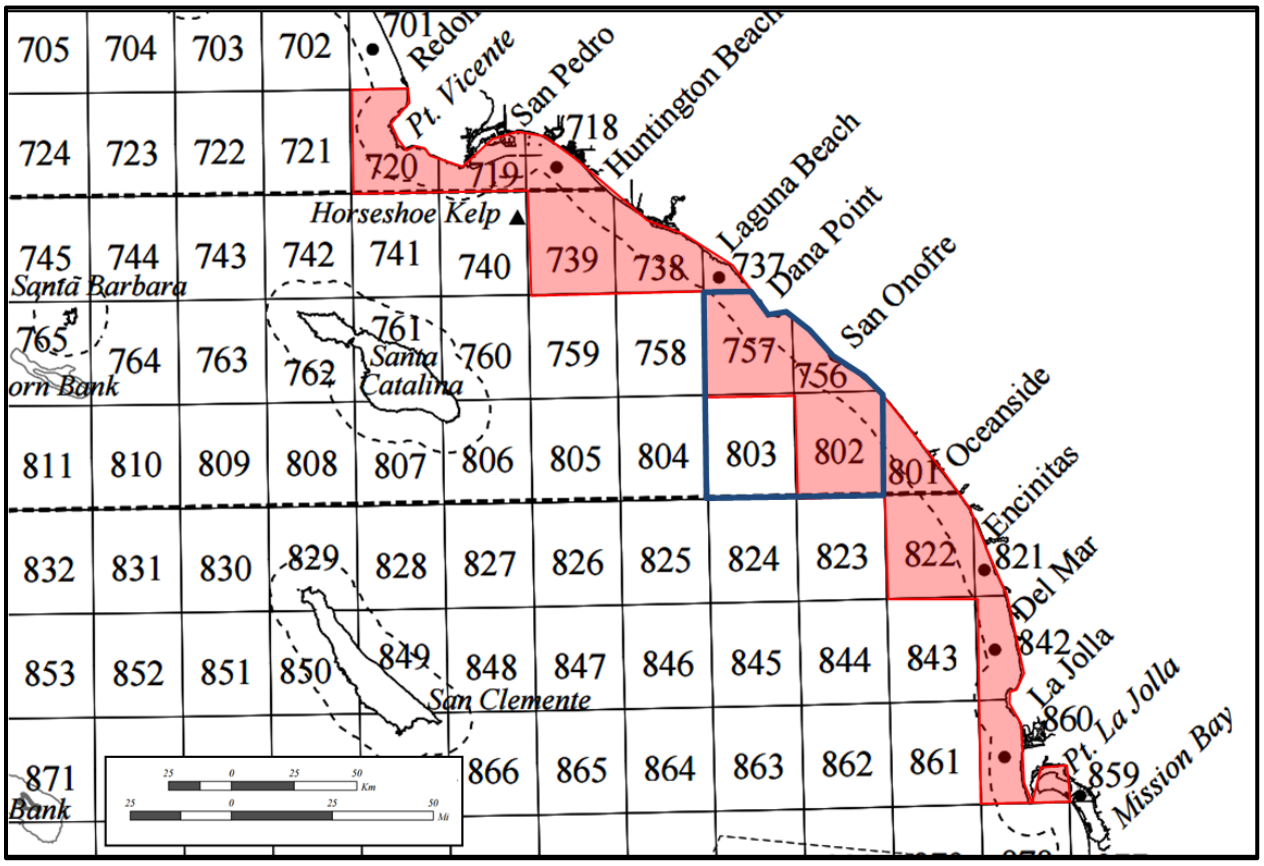


Figure 8.2-1. CDFW Catch Blocks

Source: CDFW 2001.
Note: Red highlighted blocks are nearshore fishery blocks used in this analysis. The blue border indicates blocks adjacent to the Proposed Project area used in this analysis (Blocks 757, 756, 802, and 803).

From Point Sal (30 miles north of Point Conception) to the U.S.-Mexico Border, over 167 million pounds of fish and invertebrates were recorded as caught by commercial fishermen in 2016. This represented a value of more than $199,832,000 in ex-vessel revenue (the amount paid directly to fishermen for their catch) (CDFW 2017a). The Proposed Project area is located in CDFW catch block 756 that is bordered by catch blocks 757, 803, and 802 to the north, west and south, respectively (Figure 8.2-1). The combined weight of the catch from these four blocks for the period 2012 through 2016 was approximately 10.7 million pounds representing an ex-vessel value of $9,628,853. This represents 0.7 percent of the total value of the fishery in southern California according to the combined catch block data from Point Sal to the U.S.-Mexico border for this period.

The top eight taxa by weight and value from 2012 through 2016 for CDFW catch blocks encompassing and adjacent to the Proposed Project area (blocks 756, 757, 802, 803) are shown in Table 8.2-1. These constitute 94.8 percent of the value of the fishery from these four blocks and 94.3 percent of the total weight caught. Market squid (*Doryteuthis opalescens*) is the largest fishery in these four catch blocks by value, representing 80.6 percent of the total value of the catch. Despite the high value of the market squid catch, this fishery is the second largest catch by weight, representing 22.1 percent of the total fishery weight. California spiny lobster (*Panulirus interruprus*) is the highest weight fishery in the four catch blocks for this period, with a total weight over the 5 years of greater than 4.3 million pounds. Red sea urchin ranks second by value even though it ranks 6th by weight. Pacific hagfishes rank 4th in value even though it ranks 8th in weight. Shortspine thornyhead (*Sebastolobus alascanus*) ranks 5th in value and 4th in weight. Sablefish and two species of prawn; ridgeback and spot prawn, rank amongst the remaining positions.

Table 8.2-1. Fishery Data (2012-2016): Catch Blocks 756, 757, 802, 803

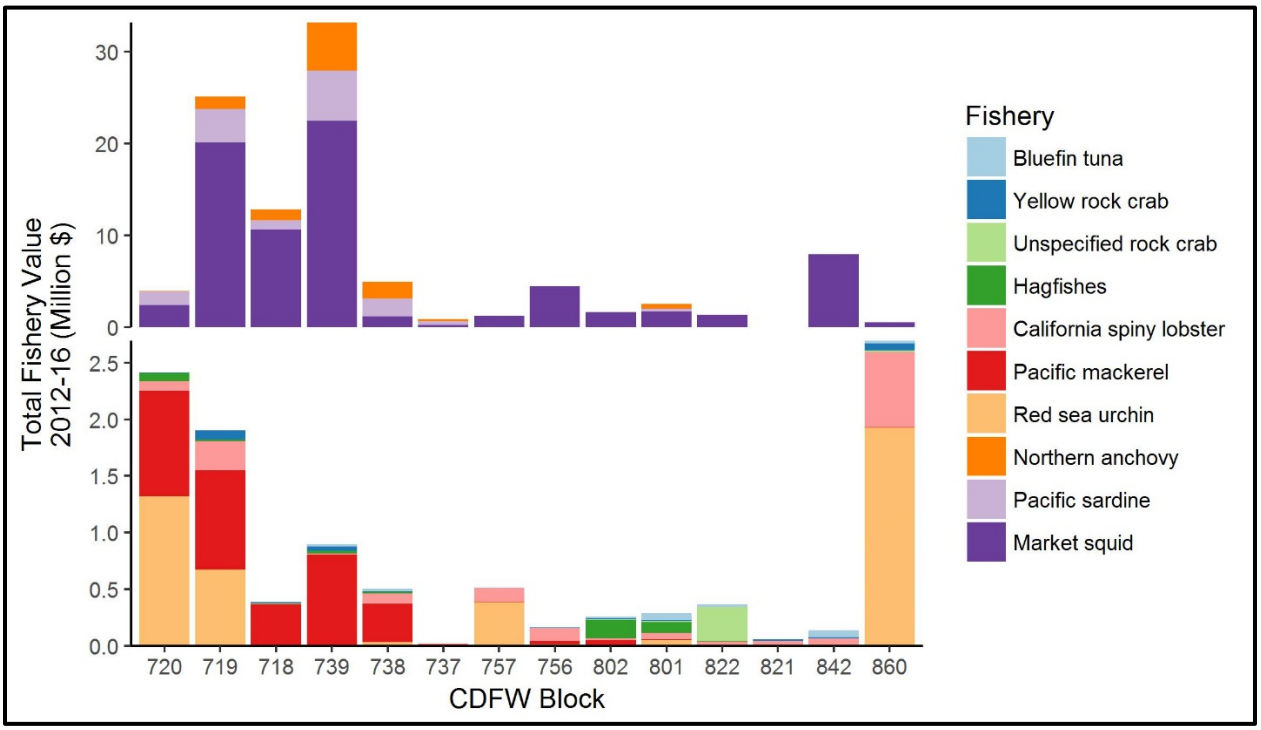
Fishery[1]	Value ($)	Proportion Value (%)	Value Rank	Weight (pounds)	Proportion Weight (%)	Weight Rank
Market squid	$7,757,487	80.6	1	2,370,144	22.1	2
Red sea urchin	$402,421	4.2	2	345,567	3.2	6
California spiny lobster	$246,402	2.6	3	4,372,374	40.8	1
Pacific hagfishes	$194,107	2.0	4	222,965	2.1	8
Shortspine thornyhead	$191,723	2.0	5	938,259	8.8	4
Ridgeback prawn	$146,283	1.5	6	441,911	4.1	5
Sablefish	$97,343	1.0	7	291,233	2.7	7
Spot prawn	$94,044	1.0	8	1,116,030	10.4	3

Source: CDFW 2017a.

Notes: [1] California spiny lobster (Panulirus interruptus); market squid (Doryteuthis opalescens); shortspine thornyhead (Sebastolobus alascanus); spot prawn (Pandalus platyceros); ridgeback prawn (Sicyonia ingentis);Sablefish (Anoplopoma fimbria); red sea urchin (Mesocentrotus franciscanus); Pacific hagfish (Eptatretus stoutii).

Fishery value in nearshore CDFW blocks upcoast and downcoast from the Proposed Project area for the most highly valued commercial fisheries was dominated by the market squid and Pacific sardine fisheries (see Figure 8.2-1 for catch block locations and Figure 8.2-2 for catches by block). Typically, fishery value was higher at the extreme ends of this range (particularly blocks 719 and 739 upcoast and block 860 downcoast). This is likely to be a combination of proximity to major landing harbors (typically fishermen will limit the distance they travel to save fuel) and the abundance of the catch, which in turn is likely to be associated with habitat in these blocks. For example, the high red sea urchin and California spiny lobster catch in block 860 may be due to the close proximity to San Diego Bay, which is a large port associated with a large population center.

Figure 8.2-2. Total Fishery Value by Nearshore Block (2012-2016)



Source: CDFW 2017a.
Note: CDFW blocks shown are only those blocks that contact the coast extending downcoast between Pt. Vicente and La Jolla. Blocks are ordered from upcoast to downcoast, left to right respectively.

The shallow rocky reef and kelp bed habitats in the Proposed Project area are the preferred habitat of California spiny lobster that can occur from the low intertidal down to depths of over 200 feet (Barsky 2001). They were found during the surveys of the Proposed Project area by MBC in 2016 (MBC 2016a), and during the study in 2004 (Tenera Environmental 2006). Females move inshore to depths less than 30 feet to extrude and fertilize the eggs. The eggs hatch 9 to 10 weeks after fertilization. Larvae are pelagic and settle inshore after 7 to 9 months in the plankton. Settlement to the seabed is continuous from May through September (Shaw 1986). Females move inshore to depths less than 33 feet to extrude and fertilize the eggs. The eggs hatch from March to December. Larvae are pelagic and are found from the surface to depths of 449 feet, and within 329 miles of shore (Marine Ecological Consultants [MEC] 1987). Upon hatching, transparent larvae (phyllosoma) go through 12 molts, increasing in size with each subsequent molt. After 5 to 10 months, the phyllosoma transform into the puerulus larval stage, which resembles the adult form but is still transparent. The puerulus actively swims inshore where it settles in shallow water. The developing juvenile lobsters usually spend up to 2 years in nearshore surfgrass beds. Based on the life history of the California spiny lobster, both the shallow reef areas close to shore where surfgrass occurs and the rocky habitat in the nearshore subtidal are important habitats for this species in the Proposed Project area.

Commercial lobster fishing using traps occurs along the shallow, rocky coastal areas of California from Point Conception to the Mexican border (Barsky 2001). The effort during the fishing season (early October to mid-March) is largely driven by ocean conditions with traps being set very close to shore at the beginning of the season in October and in 100 to 300 feet of water at the end of the season in March (Barsky 2001). Commercial fishing data records show that the area around SONGS (CDFW catch block 756) had a maximum annual value of $40,284 weighing approximately 0.6 million pounds during 2012 through 2016 (Table 8.2-2).

Table 8.2-2. California Spiny Lobster Data: Catch Block 756

Year	Value ($)	Weight (pounds)
2012	40,284	617,532
2013	24,747	425,993
2014	25,937	464,692
2015	13,816	249,445
2016	9,758	192,988
TOTAL	114,542	1,950,650

Source: CDFW 2017a.

Other fish are identified as important commercial fisheries in California. Based on SONGS impingement data, the most abundant species near SONGS is northern anchovy. Pacific sardine is also an abundant federally managed species under the CPS FMP that occurs in the area. There is a commercial fishery for northern anchovy that, on average since 2012, has annually brought in $2,113,478 in revenue from the nearshore fishery blocks. Within adjacent blocks the average annual value for northern anchovy is only $517. Anchovy are heavily fished for the live bait fishery in California, as well as an important forage fish for predatory fishes, seabirds, and marine mammals. Pacific sardine is an important commercially harvested fish and on average from 2012 through 2016, it has annually brought in $2,835,608 in revenue from the nearshore fishery blocks (CDFW 2017a). Within adjacent blocks the average annual value for Pacific sardine is $2,544. Like anchovy, Pacific sardine is a prevalent fish in the live bait fishery and is important in the diet of many predatory animals such as fishes, seabirds, and marine mammals. There is also a small-scale commercial fishery for topsmelt, although it is primarily incidental to other fisheries. White seaperch is a common surfperch that sometimes forms large schools. There is a minor commercial harvest of these perch as part of the mixed surfperch fishery (CDFW 2013). There is also some commercial harvest of white croaker and the average revenue for the period from 2011 through 2015 was $6,100 (CDFW 2017a).

8.2.2 Environmental Considerations

Impact CF-1: Loss of Commercial Fishing.

Offshore decommissioning activities could result in a loss of fishing in the local area **(Less than Significant).**

During Proposed Project activities, fishing near the intake and discharge conduits would be limited or restricted for safety reasons. Buoy lines for traps, nets, and fishing lines could become entangled in boat propellers and anchor lines; excavating, dredging, and side casting could smother traps and nets set for long periods; and the increase in large workboat activity would pose a danger to fishing vessels and recreational dive fishers.

The commercial lobster fishery is a significant fishery in the Proposed Project area that is restricted seasonally in California to winter months and typically open in late-September/early-October and close at the end of March. Commercial lobster fishermen use baited traps set on the seabed. Lobster fishermen typically target areas closer to shore earlier in the season, moving gradually offshore as the season progresses (CDFW 2003). As juvenile and adult lobsters are likely to be mobile, particularly when disturbed by Proposed Project activities, it is considered likely that they would be driven away from the immediate areas of activity into adjacent areas. Once removal of structures is complete, fishing could resume. Therefore, the impact is short term in nature.

Market squid is another important commercial, but not recreational, fishery in the area. The fishery occurs year-round, with weekend restrictions, and efforts typically increase during spawning (October through April or May) as squid die shortly after they reproduce. Commercial fishermen target squid at night, drawing aggregations into deep water and then capturing them with seine or lampara nets or similar equipment. Because Proposed Project activities are not expected to occur at night, and because market squid are highly mobile, disruption to this fishery is unlikely to be notable. Other fisheries in the area that have lesser commercial value include urchin and prawn fisheries. As is the case with the larger lobster and squid fisheries, any disruption is likely to be localized and short term.

The Applicant has proposed APM-18, which would notify local fisherman of any closures during offshore decommissioning activities to avoid any conflicts; therefore, this impact would be less than significant.

- **APM-18: Notification to Local Mariners** (Section 4.12, *Recreation and Public Access*).

8.2.3 Future Activities

Future activities, such as abandonment of the Unit 2 discharge conduit and removal of riprap (to approximately -2 feet Mean Lower Low Water based on current tidal data) and abandonment of any remaining riprap in place, are unlikely to significantly disturb habitat

or affect groundfishes, pelagic fishes, or associated Essential Fish Habitat. Any marine traffic is unlikely to affect commercial fishing. Therefore, this impact would be considered less than significant because any adverse effects to the marine environment would be significantly reduced, would have a limited spatial extent, and would be of short duration.

8.3 ENVIRONMENTAL JUSTICE CONSIDERATIONS

The Commission adopted a new comprehensive Environmental Justice Policy on December 3, 2018 (https://www.slc.ca.gov/Info/EJ/EJPolicy.pdf). Before developing its Policy, the Commission activated a robust public engagement campaign, meeting with environmental justice communities throughout California to learn about their priorities, concerns, and struggles. The Policy is intended to improve public access to open space and recreation for disadvantaged or marginalized communities, reduce pollution, support cleaner industry, and achieve more equity in the distribution of environmental benefits and burdens. It is also intended to result in more inclusive decision-making that considers the disproportionate burdens on disadvantaged communities and Native Nations. The Commission's staff report provides information on outreach conducted specifically related to the Proposed Project.

This section analyzes the presence of minority and low-income populations on a local and regional basis with respect to the Proposed Project. This consistency analysis focuses on whether the Proposed Project has the potential to adversely and disproportionately affect minority and/or low-income populations thus creating a conflict with the intent of the CSLC's Environmental Justice Policy. The Proposed Project's impact on the human environment is established in various sections of this Environmental Impact Report, including Section 4.1 (*Hazardous and Radiological Materials*), Section 4.2 (*Aesthetics*), Section 4.3 (*Air Quality*), Section 4.5 (*Cultural and Paleontological Resources*), Section 4.6 (*Cultural Resources – Tribal*), Section 4.8 (*Greenhouse Gas Emissions*), Section 4.11 (*Noise*), Section 4.12 (*Recreation and Public Access*), and Section 4.13 (*Transportation and Traffic*).

8.3.1 Environmental Setting

For the purposes of the environmental justice analysis, the terms "regional" and "localized" study areas are used when referring to the geographic extent of environmental justice populations potentially affected by the Proposed Project. For example, Orange County is considered a regional study area, and the city of San Clemente (within Orange County) is a localized study area. For comparative purposes, San Diego County is also presented as a regional study area as the Proposed Project site is located within San Diego County. However, the nearest civilian population to the site is within Orange County. The local study area is further reduced to the U.S. Census tracts located within a 6-mile radius of the Proposed Project site, which are shown in Figure 8.3-1. This radius was developed based on the air quality analysis, as representative of the greatest

distance in which localized air emission impacts could potentially occur, hereafter referred to as the Area of Potential Effect (APE).

8.3.1.1 Defining Environmental Justice Populations

Minority Population

The U.S. Council on Environmental Quality's (CEQ) Environmental Justice Guidance defines "minorities" as individuals who are members of the following population groups: American Indian or Alaskan Native, Asian or Pacific Islander, Black not of Hispanic origin, or Hispanic (CEQ 1997). The total minority population has been calculated by subtracting the white alone, not Hispanic or Latino, population from the total population. According to the CEQ environmental justice guidelines, minority populations should be identified if:

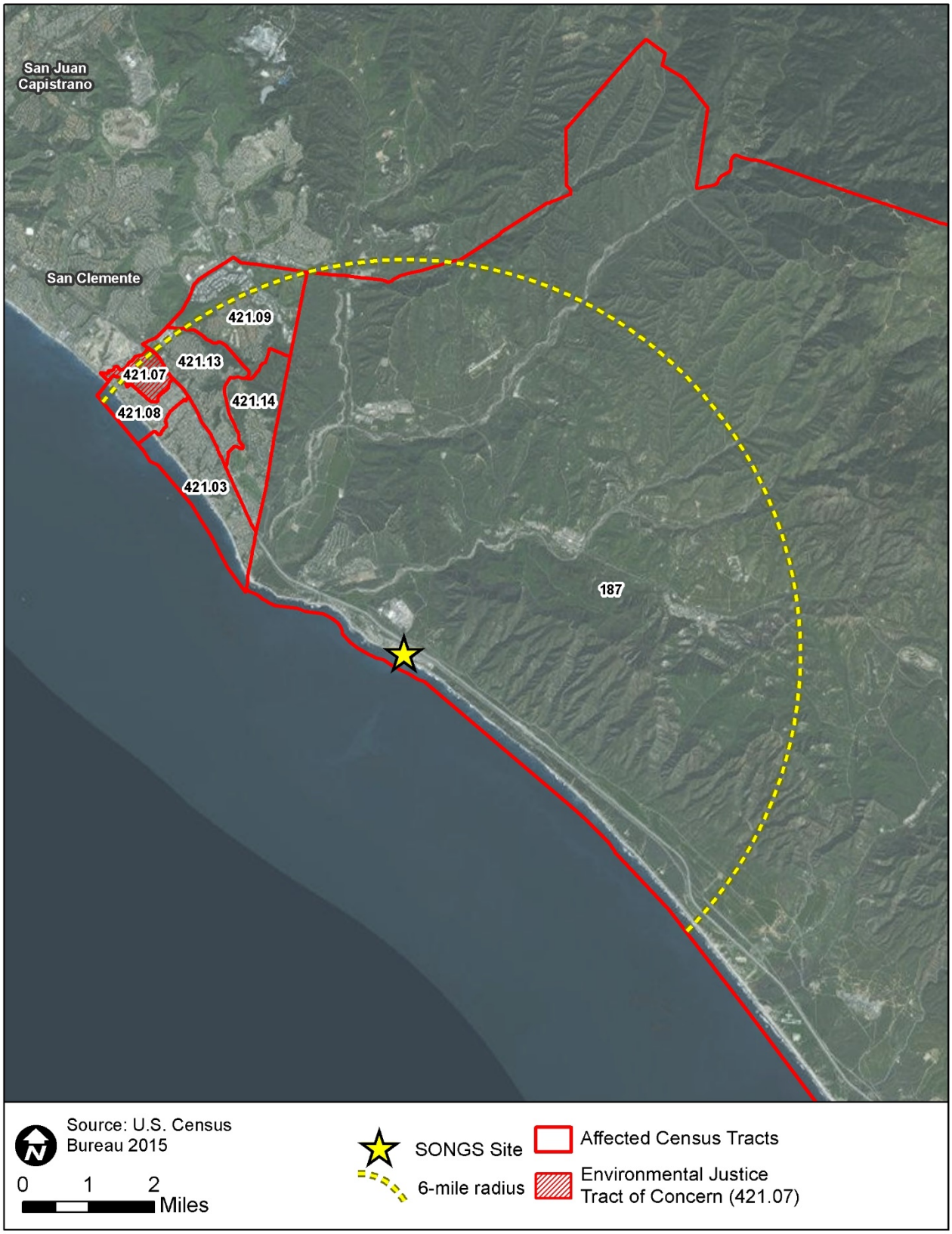
- A minority population percentage either exceeds 50 percent of the population of the affected area, or
- If the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis (e.g., a governing body's jurisdiction, neighborhood census tract, or other similar unit).

For this analysis, any census tract with a minority population greater than 50 percent is identified as an environmental justice area of concern. For such instances, the minority population is also evaluated if it is meaningfully greater than the minority population in the general larger population in which it is located. For example, a census tract is compared to the populations of the city of San Clemente, Orange County, and San Diego County.

Low-Income Population

The CEQ Environmental Justice Guidance defines "low-income populations" as populations with mean annual incomes below the annual statistical poverty level (CEQ 1997) but does not provide a discrete threshold to determine when a low-income population should be identified for environmental justice. The analysis in this EIR determined low-income populations using U.S. Census data for persons "below poverty level," and an environmental justice population when the percentage of low-income population of the potentially affected area is equal to or greater than the low-income population of the greater geography. For example, if the low-income percentage of a census tract was found equal to or greater than that of San Diego County, Orange County, or the city of San Clemente, it is identified as an environmental justice area of concern.

Figure 8.3-1. Environmental Justice Local Study Area



8.3.1.2 Study Area for Minority Population

Table 8.3-1 presents the minority population composition of the regional and local study areas based on U.S. Census 2012-2016 American Community Survey (ACS) data (U.S. Census Bureau 2018a).[57] As shown in Table 8.3-1, Census Tract 421.07 contains a minority population greater than 50 percent. Additionally, the percentage of minority population living within Census Tract 421.07 is greater than within the city of San Clemente, slightly less than Orange County, and slightly greater than San Diego County as a whole. Therefore, to be conservative, Census Tract 421.07 is considered an area containing a minority population of concern with respect to environmental justice. The location of Census Tract 421.07 is shown in Figure 8.3-1.

Table 8.3-1. Minority Population Data

Geographic Area	Total Population	Total (Percent) Minority[1]
Orange County	3,132,211	1,817,539 (58.0%)
San Diego County	3,253,356	1,733,652 (53.3%)
City of San Clemente	65,082	17,663 (27.1%)
Census Tract 187	40,616	15,909 (39.2%)
Census Tract 421.03	7,826	1,943 (24.8%)
Census Tract 421.07	4,390	2,468 (56.2%)
Census Tract 421.08	4,928	1,669 (33.9%)
Census Tract 421.09	5,076	1,529 (30.1%)
Census Tract 421.13	4,111	716 (17.4%)
Census Tract 421.14	4,259	1,020 (23.9%)

Source: U.S. Census Bureau 2018a.
Note: [1] All population other than non-Hispanic white.

8.3.1.3 Study Area for Low-Income Population

Table 8.3-2 presents populations living below the poverty level for the regional and local study areas near the Project, based on U.S. Census 2012-2016 ACS data (U.S. Census Bureau 2018b). As shown in Table 8.3-2, Census Tract 421.07 contains a percentage of the population living below the poverty level substantially greater than within the city of San Clemente and Orange County. Furthermore, it is substantially greater than San Diego County. Therefore, Census Tract 421.07 is considered an area containing a low-income population of concern with respect to environmental justice (see Figure 8.3-1).

Table 8.3-2. Low-Income Population Data

Geographic Area	Total Population for Whom Poverty Status is Determined[1]	Total (Percent) Low-Income[2]
Orange County	3,094,893	391,705 (12.5%)

[57] U.S. Census 2010-2014 ACS estimates come from a sample population, but are more current statistics than the most recent full census of 2010. Because they are based on a sample population, a certain level of variability is associated with the estimates. Supporting documentation on ACS data accuracy and statistical testing can be found on the ACS website in the Data and Documentation section available here: http://www.census.gov/acs/www/data_documentation/documentation_main/.

Table 8.3-2. Low-Income Population Data

Geographic Area	Total Population for Whom Poverty Status is Determined[1]	Total (Percent) Low-Income[2]
San Diego County	3,172,544	444,260 (14.0%)
City of San Clemente	64,965	5,916 (7.1%)
Census Tract 187	23,422	2,096 (8.9%)
Census Tract 421.03	7,826	431 (5.5%)
Census Tract 421.07	4,390	1,108 (25.2%)
Census Tract 421.08	4,928	616 (12.5%)
Census Tract 421.09	5,076	399 (7.9%)
Census Tract 421.13	4,111	358 (8.7%)
Census Tract 421.14	4,259	184 (4.3%)

Source: U.S. Census Bureau 2018b.
Notes:
[1] The total population for whom poverty status is determine may vary from the total population.
[2] Proportion of the total population living below the poverty level.

8.3.2 Environmental Considerations

Proposed Project activities would primarily occur within or near the SONGS land-based site. However, they would also affect shoreline, near-shore, and offshore areas. Only those activities with the potential to affect an environmental justice community, particularly the population residing within Census Tract 421.07, are considered with respect to environmental justice. Therefore, as most environmental impacts would be localized and occur within the SONGS site, only a limited number of environmental effects are evaluated with respect to environmental justice. The purpose of this analysis is to determine if any environmental impacts associated with the Proposed Project would be disproportionate to the population residing within Census Tract 421.07, which is the geographic area identified as having an environmental justice population of concern.

Impact EJ-1: Disproportionately Affect Minority or Low-Income Populations.

Proposed Project activities would not have disproportionate adverse impacts on the population residing within Census Tract 421.07**.**

Census Tract 421.07 is located approximately 4.1 miles northwest of SONGS (see Figure 8.3-1). Most environmental impacts resulting from the Proposed Project are from demolition activities that would be localized within the SONGS site and not capable of reaching Census Tract 421.07. However, the following discusses certain types of impacts that are capable of affecting Census Tract 421.07, with a determination if these impacts would be disproportionately borne by persons residing within Census Tract 421.07.

Air Quality

The Proposed Project would result in air pollutant emissions, including air toxics, from construction-type activities at and offshore the SONGS site and from vehicles travelling

along the Proposed Project's transportation routes. Typical air quality impacts from these types of activities result from fugitive dust emissions from earth moving, emissions from off-road heavy-duty construction equipment, and emissions from vehicles carrying construction materials and workers. Emissions from heavy-duty truck, rail and marine transportation are substantial due to the amount of waste to be removed, the amount of import materials, and offshore work that is necessary. These activities and equipment would temporarily increase the amounts of nonattainment pollutants or their precursors.

The environmental justice study area, as shown in Figure 8.3-1 (including Census Tract 421.07), is located within the South Coast Air Basin. The South Coast Air Basin is designated as being in non-attainment of State particulate matter (PM_{10} and $PM_{2.5}$) and ozone standards, and in non-attainment of Federal $PM_{2.5}$ and ozone standards.

As discussed in Section 4.3, *Air Quality*, the Proposed Project was found to result in significant regional air quality impacts for criteria pollutants within the South Coast Air Basin; however, these activities would not cause significant localized or health risk impacts (refer to Section 4.3). This impact finding is based on the type, quantity, and spatial relationship of Proposed Project pollutant emissions. The pollutant emissions associated with activities occurring under the Proposed Project would be spread across all Census Tracts shown in Figure 8.3-1 and beyond (along the major transportation routes). Concentrations of air pollutants are stronger closest to emissions sources. As distance increases away from the emissions source, concentrations become more dispersed, and therefore, reduced relative to the emissions source.

Census Tract 421.07, like other Census Tracts located within or beyond the APE, is adjacent to Interstate 5 (I-5) and the Burlington Northern Santa Fe (BNSF) rail line. These transportation routes would be used to remove waste from and import materials to the SONGS site during the Proposed Project. However, Census Tract 421.07 is not any closer to those transportation routes and is further from the SONGS site and associated work areas than many other Census Tracts (and their potentially affected population) within the APE and beyond. Therefore, when viewing the location of Census Tract 421.07 in relation to the SONGS site and transportation routes, temporary air pollutants emitted during Proposed Project activities would not be disproportionately concentrated or borne by persons residing in Census Tract 421.07 in comparison to other Census Tracts located closer to the SONGS site or also located adjacent to the main transportation routes.

Increased health risks are of concern for people exposed to excessive concentrations of hazardous or toxic air pollutants in emissions from gasoline and diesel-powered equipment. Diesel particulate matter is designated as a toxic air contaminant in California. However, as noted above, Census Tract 421.07 would not be disproportionately impacted by Proposed Project emissions in comparison to other Census Tracts (and their potentially affected population) within the APE.

Traffic and Transport of Waste

Workers would commute to work areas over local roads. In addition, the removal of waste and import of material would occur by truck and rail along the I-5 and BNSF rail line that travels through the APE (including running directly adjacent to Census Tract 421.07).

The movement of persons, equipment, and materials to work area sites via I-5 during Proposed Project activities could cause a temporary decrease in the performance level of this freeway. However, this is a regional freeway used by populations from both inside and outside the APE. Therefore, potential traffic congestion impacts along the used segments of I-5 would be equally shared by populations residing in all Census Tracts shown in Figure 8.3-1 and beyond. Any such temporary impact would not be disproportionately borne by persons residing in Census Tract 421.07.

The Proposed Project would remove waste and debris, some of which would be considered hazardous. Vehicles transporting this waste would use I-5, the BNSF rail line, and may include marine barges. However, the risk of accident or upset that could result in a spill of waste material would be equal along the entire travel route corridors that would be used. Therefore, potential impacts related to accidental release of removed waste (or a hazardous material) being transported on I-5, the BNSF rail line, or offshore would not be disproportionately borne by persons residing in Census Tract 421.07.

Impact EJ-2: Disproportionately Affect Economic Base of Minority and/or Low-Income Populations.

Proposed Project activities would not have disproportionate adverse impacts on the population residing within Census Tract 421.07**.**

Adverse impacts associated with the Proposed Project that could affect the local economy are limited to short-term public access restrictions to beach and coastal areas during certain decommissioning activities. As discussed in Chapter 4.12, Recreation and Public Access, implementation of the Proposed Project may temporarily restrict or prohibit public access to upland, shoreline, and water-dependent recreational facilities due to Proposed Project activities. Chapter 4.12 proposes mitigation (MMs REC-1a and REC-1b) that require warning signs and/or establishment of detours in areas where Proposed Project activities would impact recreational facilities. While this mitigation would reduce temporary access impacts, it is not focused or required to reduce the potential for disproportionate affects to the economic base of minority and/or low-income populations. Such impacts temporarily affecting public access to these few recreational sites would not adversely impact the local economy or disproportionately affect the economic base of minority and/or low-income populations, including the persons residing in Census Tract 421.07.

In addition to the temporary land-based public access restrictions discussed above, activities occurring under the Proposed Project (including the anchoring of barges and use of temporary seafloor laydown areas) would periodically prevent activities such as scuba diving and snorkeling, recreational boating and fishing, surfing, and windsurfing in a small area of the Pacific Ocean where offshore facilities would be removed. As discussed in Chapter 4.12, the Applicant has proposed a measure as part of the Proposed Project (APM-18 which requires that navigational protocols are followed, including notification of vessel and diving restrictions, to reduce potential interference with navigation into and out of harbors and marinas. While this mitigation would reduce temporary marine use and navigation impacts, it is not focused or required to reduce the potential for disproportionate affects to the economic base of minority and/or low-income populations. Such impacts temporarily affecting use and travel through a nominal portion of the Pacific Ocean would not adversely impact the local economy or disproportionately affect the economic base of minority and/or low-income populations, including the persons residing in Census Tract 421.07.

Proposed Project activities would also result in beneficial economic impacts to the area, some of which may be received by disadvantaged persons residing within Census Tract 421.07. Beneficial economic and tax base impacts would occur from expenditures of worker wages and salaries, as well as from the procurement of goods and services required for Proposed Project activities and sales taxes generated from goods and services purchased by workers. While such beneficial impacts would primarily be area wide, some direct economic benefits may occur within Census Tract 421.07. Additionally, existing Southern California Edison (SCE) agreements would require the use of local union and non-union workers for Proposed Project activities, which would further the potential for economic benefits at a localized level (SCE 2017b).

8.3.3 Future Activities

Other than the removal of the solid covers from the mammal exclusion barriers on the Unit 2 discharge conduit, which would be abandoned in place per the Proposed Project, removal of remaining diffuser ports on both discharge conduits, and potentially the removal of riprap above the MHTL, the Decommissioning Plan's Future Activities would occur at the SONGS site and onshore areas. Environmental justice effects would be similar to those described for the Proposed Project; impacts would not be disproportionately borne by minority and/or low-income populations, including persons residing in Census Tract 421.07).

8.4 STATE TIDE AND SUBMERGED LANDS POSSESSING SIGNIFICANT ENVIRONMENTAL VALUES

The Proposed Project involves lands identified as possessing significant environmental values within the CSLC's Significant Lands Inventory, pursuant to Public Resources Code section 6370 et seq. The Proposed Project area is located in the Significant Lands

Inventory as parcel number 37-062-100, which includes the tide lands of the Pacific Ocean lying below the ordinary high-water mark from the Orange County boundary line to the north extending south to the Santa Margarita River. The subject lands are classified in use category Class B, which authorizes limited use.

The parcel was identified as having significant environmental values regarding biological resources (benthic community, marine waters, and water-oriented bird species), and recreational activities (swimming, fishing, skin diving). Although the Proposed Project would result in temporary impacts to these values, the long-term improvements achieved by the decommissioning of the facility would be beneficial and consistent with the environmental values and use.

Based upon CSLC staff's review of the Significant Lands Inventory and through the CEQA analysis provided in this EIR, the Proposed Project will not significantly affect those lands and is consistent with the use classification.

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